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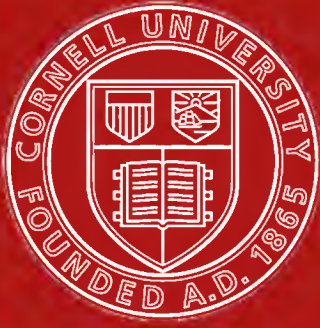
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1916



WASHINGTON
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LETTER OF TRANSMITTAL.

DEPARTMENT OF COMMERCE,
BUREAU OF THE CENSUS,
Washington, D. C., October 9, 1919.

SIR:

I transmit herewith the report containing the results of the census of transportation by water.

This census was taken in conformity with the act of Congress of March 6, 1902, as amended by act of June 7, 1906. The work of obtaining the data for the report was done by clerks detailed from the permanent force of the bureau and by correspondence, the statistics being secured during the year 1917 and covering the calendar year 1916.

The data were collected and the report prepared under the supervision of Eugene F. Hartley, chief statistician for manufactures. Acknowledgment is also made of the services of the following, who prepared the tables and text for the various sections of the report: Frederic G. Swett, F. W. Chase, Francis N. Stacy, Story B. Ladd, John G. Hawes, and Elmore W. Sanderson.

Respectfully,

SAM. L. ROGERS,
Director of the Census.

To Hon. WILLIAM C. REDFIELD,
Secretary of Commerce.

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UNITED STATES

TRANSPORTATION BY WATER

TAKEN AS OF DECEMBER 31, 1916

UNITED STATES

SCOPE OF THE CENSUS.

The census of transportation by water covers the calendar year 1916 and includes all American documented and undocumented vessels or craft of 5 tons net register or over, whether propelled by machinery, by the use of sails, or unriggered. In addition to limiting the vessels included in the census to those with a net register of 5 tons or over, reports were not secured for stationary wharf boats, scows, or craft used for storage purposes and house boats without propelling machinery used largely for residential purposes.

No reports were required for vessels owned by the Federal Government or for vessels under foreign registry, even if the latter were engaged in commerce between the United States and foreign countries.

All operations of American-owned vessels or craft were required to be reported, whether the traffic was along the coast, or on the rivers, lakes, or canals of the United States and its noncontiguous territories, or between American and foreign ports, or between foreign ports only.

The statistics for Alaska for 1916, as in 1906, are included with those for the Pacific coast. Those for Hawaii and Porto Rico are given separately, but are not included in the general totals for the United States. Craft operating exclusively in the waters of the Philippine Islands or between Philippine ports and foreign countries were not reported.

The census of 1916 includes vessels of 5 tons or over engaged in the fisheries. This class of vessels was not taken at the census of 1906, for which reason the statistics for fishing vessels are omitted in all comparative tables in this report, but are shown in those relating solely to 1916.

Vessels that were in operation during the whole or any part of the year are classed as "active craft" as distinguished from those that were "idle" during the entire year. The general tables in this report refer exclusively to "active craft." The statistics for "idle vessels," which are shown by classes, tonnage, and value, are given in a separate presentation.

The managing owners of a number of vessels of American ownership have no established office on

land at which census data can be obtained, and as such craft move from port to port it is difficult and sometimes impossible to reach them through the mail. It is probable, therefore, that a few of these vessels were omitted from the canvass. In the aggregate, however, these omissions were insignificant and in no way impair the value of these statistics.

The schedule used at the census of 1916 contained inquiries concerning the character of ownership, the class of the craft operated, the gross and net tonnage, character of materials from which constructed, motive power, waters in which operated, terminal points of regular routes, commercial value of the craft, gross income for the year, persons employed and amount paid in salaries and wages, number of passengers carried, and the quantity of different varieties of freight shipped from and delivered at the principal United States ports, and at foreign ports as a whole.

This section of the report contains a summary of the statistics for the United States as a whole, and presents most of the features developed by the schedule. The details, however, for each of the five divisions (Atlantic coast and Gulf of Mexico; Pacific coast, including Alaska; the Great Lakes and St. Lawrence River; the Mississippi River and its tributaries; and Canals and other inland waters) are presented in greater detail in separate sections which follow in the order named.

In deference to the wishes of the shipowners, and in view of the fact that it was impracticable to obtain definite information concerning the operating expenses for all of the craft included in the census, no inquiries were made concerning expenses other than the amounts paid in salaries and wages. The primary object of the census, moreover, was to show the magnitude of the transportation interests on the different waters of the United States, and it was believed that this could best be accomplished by a simple schedule applicable to all classes of craft, without attempting to secure data covering such expenses as repairs, new sails, boilers, engines, etc., taxes, insurance, dockage charges, depreciation, etc. Conclusions, therefore, in regard to profits or losses can not fairly be made from these statistics.

The statistics for 1889 have been omitted from many of the comparative tables of this report. In 1889 reports for the several divisions were not secured on a uniform basis; the totals for some included pile drivers, dredges and the necessary scows, while others did not, and the Pacific coast was the only division which included fishing vessels. In addition, there was a lack of uniformity in reporting income, employees, wages, passengers, and freight, and much of this information had to be estimated in the office. It is evident, therefore, that the totals for 1889 should not be used for exact comparison with those for 1906 and 1916.

STATISTICAL SUMMARY.

Table 1 shows, by classes of vessels (steam, sail, and unrigged), the number, gross tonnage and value, the gross income, number employed on vessels and total salaries and wages, the number of passengers, and the net tons of freight carried, including lighterage or harbor work, for the censuses of 1916, 1906, and 1889. As previously stated, vessels engaged in the fisheries, for which reports were secured in 1916, are not included in any of the comparative tables of this report, because statistics concerning such vessels were not secured in 1906 or 1889.

TABLE 1.—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916, 1906, AND 1889.

	TOTAL.			STEAM (INCLUDES CRAFT PROPELLED BY MACHINERY).			SAIL (INCLUDES SCHOONER BARGES, ETC.).			UNRIGGED.		
	1916	1906	1889 ¹	1916	1906	1889	1916	1906	1889	1916	1906	1889
Number of vessels.....	37,894	37,321	30,485	14,581	9,927	5,603	3,002	7,131	7,945	20,311	20,263	16,937
Gross tonnage.....	12,249,990	12,893,429	8,359,135	6,097,562	4,059,521	1,710,073	1,171,174	1,704,277	1,675,706	4,981,254	7,129,631	4,973,356
Value of vessels.....	\$959,925,364	\$507,973,121	\$206,992,352	\$302,155,109	\$386,772,727	\$131,567,427	\$60,550,495	\$56,206,145	\$53,192,972	\$97,219,760	\$64,904,249	\$22,231,953
Gross income.....	\$563,736,367	\$294,854,532	\$161,994,066	\$524,238,639	\$262,167,342	\$113,715,700	\$39,497,728	\$32,687,190	\$48,278,366	(²)	(³)	(⁴)
Number employed on vessels.....	153,301	140,929	113,870	139,264	115,525	70,347	14,037	25,404	44,523	(⁵)	(⁶)	(⁷)
Wages.....	\$103,235,534	\$71,636,521	\$41,482,812	\$95,838,913	\$61,265,474	\$28,521,220	\$7,396,621	\$10,371,047	\$12,961,592	(⁸)	(⁹)	(¹⁰)
Number of passengers carried.....	331,590,565	366,825,663	198,992,438	331,589,698	366,800,748	198,992,438	867	24,915	.....	(¹¹)	(¹²)	(¹³)
Freight and harbor work (tons of 2,000 pounds).....	381,352,926	265,545,804	129,851,658	194,248,794	(¹⁴)	(¹⁵)	16,877,349	(¹⁶)	(¹⁷)	170,226,783	(¹⁸)	(¹⁹)
Freight carried.....	253,002,611	177,519,758	(²⁰)	187,862,129	(²¹)	(²²)	16,782,009	(²³)	(²⁴)	53,358,473	(²⁵)	(²⁶)
Harbor work.....	123,350,315	88,026,046	(²⁷)	6,386,665	(²⁸)	(²⁹)	95,340	(³⁰)	(³¹)	116,868,310	(³²)	(³³)

¹ Includes 52 craft with a gross tonnage of 2,553, valued at \$75,360, for which no report was made for income, employees, wages, number of passengers and freight carried.

² Exclusive of income for canal boats.

³ Included in statistics for steam vessels.

⁴ Exclusive of employees and wages on canal boats, and employees and wages on yachts on the Atlantic coast.

⁵ Statistics for freight not strictly comparable. The total for 1916 is exclusive of 80,048 tons of freight carried on fishing vessels. Such craft were not fully reported by the Census Office at prior censuses.

⁶ Includes 2,003,453 net tons of bunker coal.

⁷ Figures not available.

⁸ Exclusive of harbor work on the Great Lakes, in 1906.

The total active fleet of the United States in 1916, exclusive of fishing vessels, numbered 37,894 vessels with a gross tonnage of 12,249,990 and a valuation of \$959,925,364. Although there was a decrease of 643,439, or 5 per cent, in the tonnage during the 10 years from 1906 to 1916, the increase in valuation, \$451,952,243, or 89 per cent, is marked. The increase in valuation was due to the great demand for tonnage created by the war.

The gross income of the vessels reported for 1916 was \$563,736,367 as compared with \$294,854,532 in 1906, an increase of \$268,881,835, or 91.2 per cent. The number of passengers carried shows a decrease of 35,235,098, or 9.6 per cent. This decrease was due chiefly to the reduction in ferry travel in New York City district caused by the construction of bridges and tunnels, or tubes, since 1906. The total shown for 1916, 331,590,565, is larger than that given by the Supervising Inspector General of the Steamboat-

Inspection Service for the year ended June 30, 1916.¹ The census report covers the calendar year 1916 and includes the number of passengers carried on vessels that are not required by law to report such data to the Steamboat-Inspection Service.

The increase in quantity of freight carried, including harbor work, during the 10 years was 115,807,122 net tons, or 43.6 per cent. The percentage of increase was slightly more for actual freight than for harbor work.

It is interesting to note that for the 27 years shown in the table, 1889 to 1916, there was an increase of 7,409, or 24.3 per cent, in number of vessels; of 3,890,855, or 46.5 per cent, in gross tonnage; and of \$752,933,012, or 363.7 per cent, in their value.

Percentages of increase, based on the figures in Table 1, 1889 to 1916, and 1906 to 1916, are given in Table 2.

¹ Report to the Secretary of Commerce, p. 22.

TABLE 2.—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS, PER CENT OF INCREASE: 1889-1916 AND 1906-1916.

	PER CENT OF INCREASE ¹ .							
	Total.		Steam.		Sail.		Unrigged.	
	1906-1916	1889-1916	1906-1916	1889-1916	1906-1916	1889-1916	1906-1916	1889-1916
Number of vessels.....	1.5	24.3	46.9	160.2	-57.9	-62.2	0.2	19.9
Gross tonnage.....	-5.0	46.5	50.2	256.6	-31.3	-30.1	-30.1	0.2
Value of vessels.....	59.0	363.7	107.4	509.7	7.7	13.8	49.6	337.3
Gross income.....	91.2	248.0	100.0	361.0	20.8	-18.2	.....	.....
Number employed on vessels.....	8.8	34.6	20.5	98.0	-44.7	-67.7	.....	.....
Wages.....	44.1	148.9	56.4	236.0	-28.7	-42.9	.....	.....
Number of passengers carried.....	-9.6	66.6	-9.6	66.6	-96.5	.....	.....	.....
Freight and harbor work (tons of 2,000 pounds).....	43.6	193.7	.....	.....	.....	.....	.....	.....
Freight carried.....	45.3	.....	.....	.....	.....	.....	.....	.....
Harbor work.....	40.1	.....	.....	.....	.....	.....	.....	.....

¹ A minus sign (-) denotes decrease.

TABLE 3.—ALL VESSELS AND CRAFT, BY OCCUPATION, WITH PER CENT OF TOTAL: 1916.

OCCUPATION.	VESSELS.		TONNAGE.		VALUE OF VESSELS.		GROSS INCOME.		EMPLOYED ON VESSELS.		WAGES.	
	Number.	Per cent of total.	Gross tons.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.	Number.	Per cent of total.	Amount.	Per cent of total.
United States.....	43,110	100.0	12,395,236	100.0	\$979,338,633	100.0	\$589,124,837	100.0	179,276	100.0	\$115,110,891	100.0
Commercial vessels.....	37,546	87.1	12,203,670	98.5	930,568,484	95.0	583,347,144	99.0	168,762	94.1	108,389,194	94.2
Freight and passenger.....	7,719	17.9	6,588,707	53.2	735,748,786	75.1	423,966,259	72.0	92,247	51.5	61,766,501	53.7
Tug and other towing vessels.....	3,689	8.6	264,135	2.1	54,909,495	5.6	39,626,487	6.7	23,476	13.1	15,929,657	13.8
Fishing vessels.....	5,216	12.1	145,246	1.2	19,463,269	2.0	25,388,520	4.3	25,975	14.5	11,875,367	10.3
Ferryboats.....	611	1.4	224,328	1.8	23,227,174	2.4	15,414,979	2.6	4,282	2.4	3,947,836	3.4
Municipal.....	40	0.1	25,230	0.2	2,755,322	0.3	1,317,773	0.2	570	0.3	638,785	0.6
Railroad.....	114	0.3	123,054	1.0	13,600,175	1.4	8,232,054	1.4	1,708	1.0	1,877,645	1.6
All other.....	467	1.1	76,044	0.6	6,811,677	0.7	5,865,152	1.0	2,004	1.1	1,431,406	1.2
Unrigged craft.....	20,311	47.1	4,981,254	40.2	97,219,760	9.9	78,950,899	13.4	22,782	12.7	14,869,843	12.9
Yachts.....	4,354	10.1	123,007	1.0	35,387,656	3.6	207,747	(¹)	6,772	3.8	3,683,538	3.2
Miscellaneous.....	1,210	2.8	68,559	0.6	13,432,493	1.4	5,569,996	0.9	3,742	2.1	3,038,159	2.6

¹ Less than one-tenth of 1 per cent.

All but 12.9 per cent of the total number and 1.6 per cent of the total tonnage of the vessels reported for 1916, including those engaged in fishing, were commercial vessels. The noncommercial vessels represented yachts, launches, miscellaneous craft, etc.

The commercial vessels, whether classed as freight and passenger, tugs, fishing craft, ferryboats, or unrigged craft, were engaged directly or indirectly in the transportation of freight and passengers or in the fisheries. Their tonnage, 12,203,670, represented 98.5 per cent of the total for all classes.

The regular freight and passenger craft formed 53.2 per cent of the total tonnage for all classes. Their value, however, was of much greater relative importance, contributing 75.1 per cent of the whole, while the gross income formed 72 per cent of the total. The number of employees was 51.5 per cent of the total, and their salaries and wages formed 53.7 per cent of the total for all craft.

In number, the unrigged craft formed 47.1 per cent of the whole and their tonnage 40.2 per cent; their value, however, was but 9.9 per cent. The gross income, number employed on vessels, and salaries and wages shown for unrigged craft formed small por-

The decreases from 1906 to 1916 which seriously affect the totals shown in the table for the United States for all craft combined, with two exceptions, the tonnage of unrigged craft and the number of passengers carried by steam vessels, are due to the decline in the tonnage of sailing vessels. The only increases shown for sailing vessels are in value and in gross income, due to the exceptional demand for tonnage in 1916. The reduction in number of passengers carried, as already explained, was practically due to local ferry conditions in the New York City district. The loss in unrigged tonnage was confined to two divisions—the Mississippi River and its tributaries, and Canals and other inland waters, located chiefly in the former division.

portions of the totals in this table. This condition, however, is due, in part, to the fact that the compensation for freight carried or lightered was sometimes credited to the tug or craft doing the towing. Similar conditions pertain also to employees on the unrigged craft and their salaries and wages.

STEAM VESSELS.

All craft propelled by machinery—steam, gasoline, electricity, or other—are included in the total for steam vessels in the comparative tables. Craft equipped with sails but having auxiliary propelling machinery are likewise included. The occupations of these vessels are various, among them being freight and passenger service, towing in harbor and other waters, and ferriage. Yachts, although used for pleasure only, are also included. Craft classed as "miscellaneous" in the table include such as are utilized principally in wrecking operations, pile driving, dredging, police and patrol duty, dispatch and mail service, taking out fishing and pleasure parties, etc. Table 4 shows the number, gross tonnage, and value of steam vessels, by occupation, with per cent of increase, for both 1916 and 1906.

TABLE 4.—STEAM VESSELS,¹ EXCLUSIVE OF FISHING VESSELS, BY OCCUPATION, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916 AND 1906.

OCCUPATION AND CENSUS YEAR.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Value of vessels.	Per cent of total.
Total:						
1916.....	14,581	100.0	6,097,562	100.0	\$802,155,109	100.0
1906.....	9,927	100.0	4,059,521	100.0	386,772,727	100.0
Per cent of increase.....	46.9		50.2		107.4	
Freight and passenger:						
1916.....	5,362	36.8	5,432,353	89.1	677,475,337	84.5
1906.....	3,615	36.4	3,411,588	84.0	286,218,089	74.0
Per cent of increase.....	48.3		59.2		136.7	
Tugs and other towing vessels:						
1916.....	3,689	25.3	264,135	4.3	54,909,495	6.8
1906.....	3,079	31.0	261,375	6.4	39,062,249	10.1
Per cent of increase.....	19.8		1.1		40.6	
Ferryboats:						
1916.....	611	4.2	224,328	3.7	23,227,174	2.9
1906.....	536	5.4	261,073	6.4	29,578,380	7.6
Per cent of increase.....	14.0		-14.1		-21.5	
Yachts:						
1916.....	3,785	26.0	111,620	1.8	33,447,143	4.2
1906.....	2,176	21.9	82,275	2.0	24,281,861	6.3
Per cent of increase.....	73.9		35.7		37.7	
Miscellaneous:						
1916.....	1,134	7.8	65,126	1.1	13,095,960	1.6
1906.....	521	5.2	43,210	1.1	7,632,148	2.0
Per cent of increase.....	117.7		50.7		71.6	

¹ Includes craft propelled by machinery.

² A minus sign (—) denotes decrease.

Percentages of increase are shown throughout this table except for ferryboats, which decreased in gross tonnage and value. There was an increase in 1916 over 1906 in the proportion of the total number of

vessels contributed by each of the five classes, except for tugs and for ferryboats. For gross tonnage and for value, however, the only class showing an increased proportion was the freight and passenger.

At the census of 1916, as well as that of 1906, a little more than one-third of the total number of steam vessels were regular freight and passenger steamers. Their proportion of the total tonnage in 1906 was 84 per cent which in 1916 had increased to 89.1 per cent; while their value, which at the earlier census formed 74 per cent of the total, at the later had risen to 84.5 per cent. Although tugs and other towing vessels increased in number, tonnage, and value during the 10 years, there was a decided decrease in their proportion of each of these totals. The decline in the proportion of the ferryboat class is explained in connection with Tables 14 and 15. Although yachts increased considerably in number, tonnage, and value between 1906 and 1916, their proportion of the total tonnage and total value of all classes of steam vessels combined was less in 1916 than at the prior census.

The number, gross tonnage, value, gross income, number of employees on vessels, and their salaries and wages for steam vessels, by geographic divisions, are shown in Table 5 for 1916, 1906, and 1889.

TABLE 5.—STEAM VESSELS,¹ BY DIVISIONS, WITH PER CENT OF INCREASE: 1916, 1906, AND 1889.

DIVISION AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number employed on vessels.	Wages.
Total:						
1916.....	14,581	6,097,562	\$802,155,109	\$445,287,740	116,482	\$80,969,070
1906.....	9,927	4,059,521	386,772,727	262,167,342	115,525	61,265,474
1889.....	5,603	1,710,073	131,567,427	113,715,700	70,347	28,621,220
Atlantic coast and Gulf of Mexico:						
1916.....	8,347	2,828,953	517,410,317	285,871,084	59,799	43,029,076
1906.....	5,413	1,457,894	193,926,327	139,717,909	58,470	31,664,945
1889.....	2,536	741,770	65,518,640	57,034,216	23,528	13,284,325
Pacific coast (including Alaska):						
1916.....	2,123	710,360	105,987,697	66,855,181	18,500	15,232,382
1906.....	1,066	518,107	60,440,145	40,220,388	15,661	10,230,828
1889.....	465	160,293	14,767,355	12,969,914	6,682	3,567,226
Great Lakes and St. Lawrence River:						
1916.....	1,837	2,410,430	162,256,355	79,505,305	24,163	17,027,341
1906.....	1,676	1,915,786	116,983,812	60,933,528	22,658	12,318,174
1889.....	1,467	595,813	40,868,824	27,223,207	16,968	6,294,188
Mississippi River and its tributaries:						
1916.....	1,700	119,963	13,143,054	11,502,672	12,509	5,091,681
1906.....	1,435	146,227	13,196,770	17,342,038	15,016	5,692,117
1889.....	972	192,974	9,622,608	16,331,872	15,951	5,337,185
All other inland waters:						
1916.....	574	27,856	3,357,686	1,553,498	1,511	588,590
1906.....	337	21,507	2,225,673	3,953,479	3,720	1,359,410
1889.....	163	19,223	790,000	166,491	218	38,296
PER CENT OF INCREASE. ³						
Total:						
1906-1916.....	46.9	50.2	107.4	69.8	0.8	32.2
1889-1916.....	160.2	256.6	509.7	291.6	65.6	183.9
Atlantic coast and Gulf of Mexico:						
1906-1916.....	54.2	94.0	166.8	104.6	2.3	35.9
1889-1916.....	229.1	281.4	689.7	401.2	95.9	223.9
Pacific coast (including Alaska):						
1906-1916.....	99.2	37.1	75.4	66.2	18.1	48.9
1889-1916.....	356.6	343.2	617.7	415.9	176.9	327.0
Great Lakes and St. Lawrence River:						
1906-1916.....	9.6	25.8	38.7	30.5	6.6	38.2
1889-1916.....	25.2	304.6	297.0	192.0	42.4	170.5
Mississippi River and its tributaries:						
1906-1916.....	18.5	-18.0	-0.4	-33.7	-16.7	-10.5
1889-1916.....	74.9	-37.8	36.6	-29.6	-21.6	-4.6
All other inland waters:						
1906-1916.....	70.3	29.5	50.9	-60.7	-59.4	-56.7
1889-1916.....	252.1	44.9	325.0	(⁴)	(⁴)	(⁴)

¹ Includes craft propelled by machinery.

² The employees and wages for yachts were not reported.

³ A minus sign (—) denotes decrease.

⁴ Income, number of employees, and wages were not reported for canal boats at the census of 1889, and therefore the percentage of increase is not given.

The growth in number of vessels has been continuous in each geographic division since 1889. The percentages of increase shown for the 27 years, 1889 to 1916, in this table, however, should be accepted with the qualification previously mentioned, that the statistics for 1889 are not strictly comparable with those for 1906 and 1916. The gross tonnage and value of vessels in each division, except for the Mississippi River and its tributaries, show continuous growth. In this division there was a decrease from 1906 to 1916 of 18 per cent in tonnage and a slight decrease, four-tenths of 1 per cent, in value. "All other inland waters" shows decreases in gross income, number employed on vessels, and salaries and wages, but with these exceptions, the divisions have steadily increased in each of the several important details covered by the table.

During the 10 years from 1906 to 1916 the gross income of steam vessels in the Atlantic coast and Gulf of Mexico division increased \$146,153,175, or 104.6 per cent; in the Pacific coast, \$26,634,793, or 66.2 per cent; and in the Great Lakes, \$18,571,777, or 30.5 per cent.

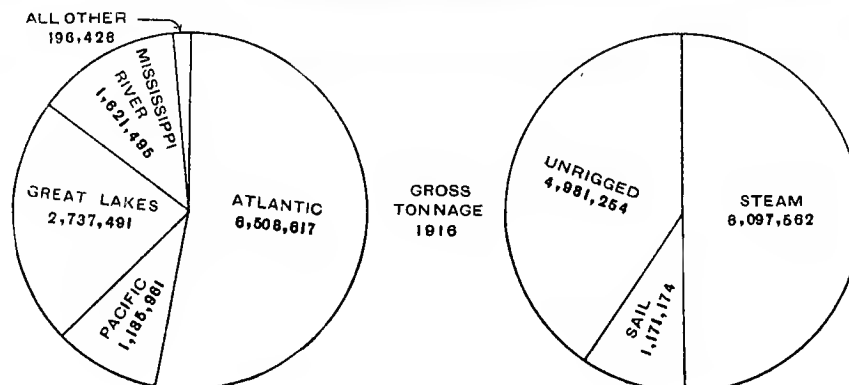
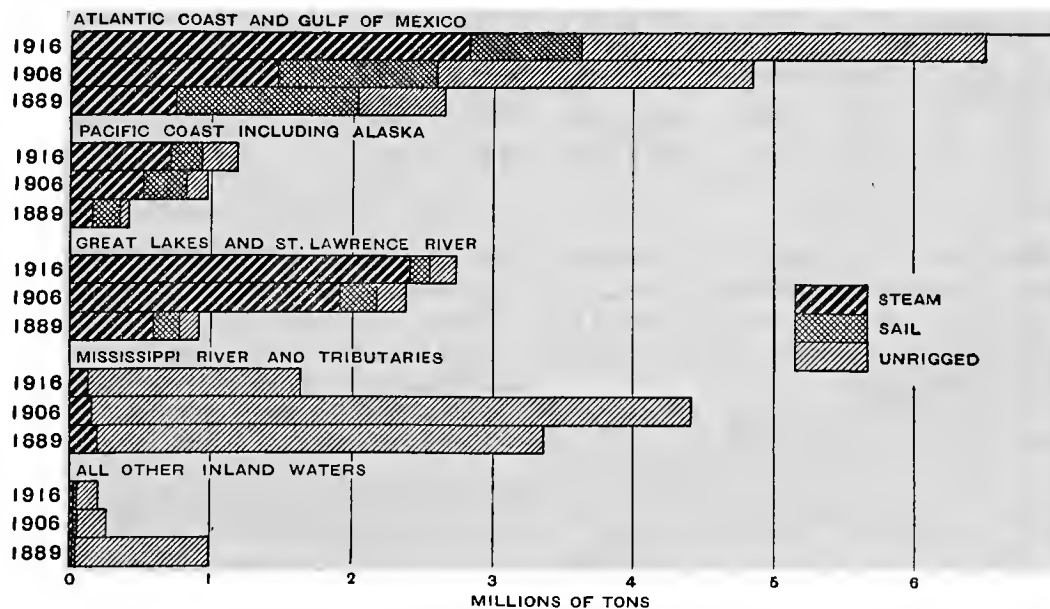
The relative importance of steam vessels in each of the five divisions at the censuses of 1916, 1906, and 1889 is shown in Table 6.

TABLE 6.—STEAM VESSELS,¹ PER CENT IN EACH DIVISION: 1916, 1906, AND 1889.

DIVISION AND CENSUS YEAR.	PER CENT OF TOTAL.					
	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number employed on vessels.	Wages.
Total:						
1916.....	100.0	100.0	100.0	100.0	100.0	100.0
1906.....	100.0	100.0	100.0	100.0	100.0	100.0
1889.....	100.0	100.0	100.0	100.0	100.0	100.0
Atlantic coast and Gulf of Mexico:						
1916.....	57.2	46.4	64.5	64.2	51.3	53.1
1906.....	54.5	35.9	50.1	53.3	50.6	51.7
1889.....	45.3	43.4	49.8	50.2	43.4	46.6
Pacific coast (including Alaska):						
1916.....	14.6	11.6	13.2	15.0	15.9	18.8
1906.....	10.7	12.8	15.6	15.3	13.6	16.7
1889.....	8.3	9.4	11.2	11.4	9.5	12.5
Great Lakes and St. Lawrence River:						
1916.....	12.6	39.5	20.2	17.9	20.7	21.0
1906.....	16.9	47.2	30.2	23.2	19.6	20.1
1889.....	26.2	34.8	31.1	23.9	24.1	22.1
Mississippi River and its tributaries:						
1916.....	11.7	2.0	1.6	2.6	10.7	6.3
1906.....	14.5	3.6	3.4	6.6	13.0	9.3
1889.....	17.3	11.3	7.3	14.4	22.7	18.7
All other inland waters:						
1916.....	3.9	0.5	0.4	0.3	1.3	0.7
1906.....	3.4	0.5	0.6	1.5	3.2	2.2
1889.....	2.9	1.1	0.6	0.1	0.3	0.1

¹ Includes craft propelled by machinery.

DIAGRAM 1.—GROSS TONNAGE OF STEAM, SAIL, AND UNRIGGED VESSELS, BY DIVISIONS: 1916, 1906, AND 1889.



TRANSPORTATION BY WATER.

TABLE 7.—STEAM, SAIL, AND UNRIGGED VESSELS, BY DIVISIONS, WITH PER CENT OF INCREASE: 1916, 1906, AND 1889.

DIVISION AND CENSUS YEAR.	TOTAL.			STEAM. ¹			SAIL.			UNRIGGED.		
	Num- ber of vessels.	Gross tonnage.	Value of vessels.	Num- ber of vessels.	Gross tonnage.	Value of vessels.	Num- ber of vessels.	Gross tonnage.	Value of vessels.	Num- ber of vessels.	Gross tonnage.	Value of vessels.
Total:												
1916.....	37,894	12,249,990	\$959,925,364	14,581	6,097,562	\$802,155,109	3,002	1,171,174	\$60,550,495	20,311	4,981,254	\$97,219,760
1906.....	37,321	12,893,429	507,973,121	9,927	4,059,521	386,772,727	7,131	1,704,277	56,206,145	20,263	7,129,631	64,994,249
1889.....	30,485	8,359,135	206,992,352	5,603	1,710,073	131,567,427	7,945	1,675,706	53,192,972	16,937	4,973,356	22,231,953
Atlantic coast and Gulf of Mexico:												
1916.....	21,658	6,508,617	629,074,203	8,347	2,828,953	517,410,317	2,539	803,426	42,980,897	10,772	2,876,238	68,732,989
1906.....	20,032	4,851,421	273,105,915	5,413	1,457,894	193,926,327	5,920	1,132,905	37,520,903	8,699	2,260,622	41,658,685
1889.....	12,238	2,658,445	116,042,062	2,536	741,770	65,518,640	6,277	1,293,192	42,685,982	3,425	623,483	7,837,440
Pacific coast (including Alaska):												
1916.....	4,092	1,185,961	127,310,646	2,123	710,360	105,987,697	296	222,040	13,259,661	1,673	253,561	8,063,288
1906.....	2,537	977,687	76,622,633	1,066	518,107	60,440,145	666	305,283	11,533,171	805	154,297	4,649,317
1889.....	1,635	419,157	21,824,040	465	160,293	14,767,355	681	195,508	6,231,340	489	63,356	825,345
Great Lakes and St. Lawrence River:												
1916.....	2,856	2,737,491	174,765,526	1,837	2,410,430	162,256,355	162	145,450	4,351,287	857	181,611	8,157,884
1906.....	2,990	2,392,863	130,805,640	1,676	1,915,786	116,983,812	531	265,571	7,135,271	783	211,506	6,686,557
1889.....	2,737	920,294	48,580,174	1,467	595,813	40,868,824	962	185,081	4,238,850	308	139,400	3,472,500
Mississippi River and its tributaries:												
1916.....	7,239	1,621,495	23,030,503	1,700	119,963	13,143,054				5,539	1,501,532	9,887,440
1906.....	9,622	4,411,967	22,852,142	1,435	146,227	13,196,770				8,187	4,265,740	9,653,372
1889.....	7,300	3,364,610	14,407,162	972	192,974	9,622,608				6,328	3,171,636	4,784,554
All other inland waters:												
1916.....	2,049	196,426	5,744,486	574	27,856	3,357,686	5	258	8,650	1,470	168,312	2,378,150
1906.....	2,140	259,491	4,586,791	337	21,507	2,228,673	14	518	16,800	1,789	237,466	2,344,318
1889.....	6,575	996,629	6,138,914	163	19,223	790,000	25	1,925	36,800	6,387	975,481	5,312,114
PER CENT OF INCREASE. ²												
Total:												
1906-1916.....	1.5	-5.0	89.0	46.9	50.2	107.4	-57.9	-31.3	7.7	0.2	-30.1	49.6
1889-1916.....	24.3	46.5	363.7	160.2	256.6	509.7	-62.2	-30.1	13.8	19.9	0.2	337.3
Atlantic coast and Gulf of Mexico:												
1906-1916.....	8.1	34.2	130.3	54.2	94.0	166.8	-57.1	-29.1	14.4	23.8	27.2	65.0
1889-1916.....	77.0	144.8	442.1	229.1	281.4	689.7	-59.6	-37.9	0.6	214.5	361.3	770.0
Pacific coast (including Alaska):												
1906-1916.....	61.3	21.3	66.2	99.2	37.1	75.4	-55.6	-27.3	15.0	107.8	64.3	73.4
1889-1916.....	150.3	182.9	483.4	356.6	343.2	617.7	-56.5	13.6	112.8	242.1	300.2	877.0
Great Lakes and St. Lawrence River:												
1906-1916.....	-4.5	14.4	33.6	9.6	25.8	38.7	-69.5	-45.2	-39.0	9.5	-14.1	22.0
1889-1916.....	4.3	197.5	259.7	25.2	304.6	297.0	-83.2	-21.4	2.7	178.2	30.3	134.9
Mississippi River and its tributaries:												
1906-1916.....	-24.8	-63.2	0.8	18.5	-18.0	-0.4				-32.3	-64.8	2.4
1889-1916.....	-0.8	-51.8	59.9	74.9	-37.8	36.6				-12.5	-52.7	106.7
All other inland waters:												
1906-1916.....	-4.3	-24.3	25.2	70.3	29.5	50.9		-50.2	-48.5	-17.8	-29.1	1.4
1889-1916.....	-68.8	-80.3	-6.4	252.1	44.9	325.0		-73.1	-76.5	-77.0	-82.7	-55.2

¹ Includes craft propelled by machinery.² A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

The fact should not be lost sight of in connection with the following discussion of Table 6, that the percentages show only the different ratios of growth for each division, and must not be confused with the actual figures for the several totals.

Nearly two-thirds of the total value and the gross income in 1916 are shown for the Atlantic coast and Gulf of Mexico, which reported little more than one-half of the employees and of the salaries and wages paid. While these proportions are increases over both of the preceding censuses, the advances are specially marked in value of vessels and income. The Great Lakes and St. Lawrence River division is second in all these particulars, the proportion of its gross income, however, decreasing from nearly one-fourth of the total for all divisions in 1906 to less than one-fifth in 1916. The Pacific coast ranks third in the proportions shown in Table 6, which, although consider-

ably greater in all particulars than in 1889, show slight decreases in 1916, as compared with 1906, in tonnage, value of vessels, and income. Decreases in the proportions of each item shown in the table for the Mississippi River and its tributaries have been continuous since 1889, while the division "All other inland waters," although increasing its small proportion of gross income, employees, and salaries and wages from 1889 to 1906, since the latter year, shows a retrograde movement.

A presentation of the number, tonnage, and value of steam vessels, for 1916, 1906, and 1889, compared with the sail and unriggered craft, is made for the United States and by divisions in Table 7, with percentages of increase or decrease.

The relative importance of the different divisions at the censuses of 1916, 1906, and 1889 is shown in Table 8 on the next page.

DIAGRAM 2.—VALUE OF STEAM, SAIL, AND UNRIGGED VESSELS BY DIVISIONS: 1916, 1906, AND 1889.

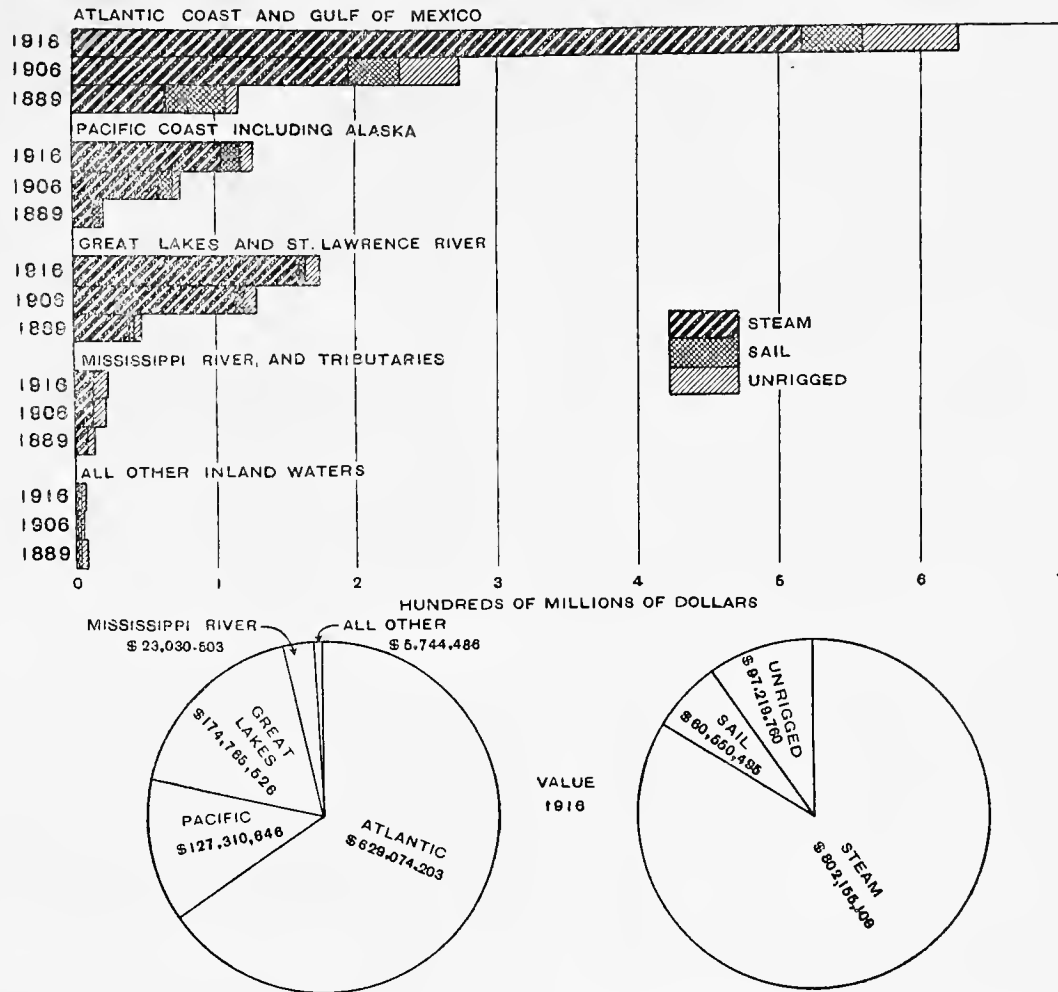


TABLE 8.—STEAM, SAIL, AND UNRIGGED VESSELS, WITH PER CENT IN EACH DIVISION: 1916, 1906, AND 1889.

DIVISION AND CENSUS YEAR.	STEAM. ¹			SAIL.			UNRIGGED.			DIVISION AND CENSUS YEAR.	STEAM. ¹			SAIL.			UNRIGGED.		
	Number of ves-sels.	Gross ton-nage.	Value of ves-sels.	Number of ves-sels.	Gross ton-nage.	Value of ves-sels.	Number of ves-sels.	Gross ton-nage.	Value of ves-sels.		Number of ves-sels.	Gross ton-nage.	Value of ves-sels.	Number of ves-sels.	Gross ton-nage.	Value of ves-sels.	Number of ves-sels.	Gross ton-nage.	Value of ves-sels.
Total:																			
1916.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	Great Lakes and St. Lawrence River:									
1906.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1916.....	12.6	32.5	20.2	5.4	12.4	7.2	4.2	3.6	8.4
1889.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1906.....	16.9	47.2	30.2	7.4	15.6	12.7	3.9	3.0	10.3
Atlantic coast and Gulf of Mexico:										1889.....	26.2	34.8	31.1	12.1	11.0	8.0	1.8	2.8	15.6
1916.....	57.2	46.4	64.5	84.6	68.6	70.9	53.0	57.7	70.7	Mississippi River and its tributaries:									
1906.....	54.5	35.9	50.1	83.0	66.5	66.8	42.9	31.7	64.1	1916.....	11.7	2.0	1.6				27.3	30.1	10.2
1889.....	45.3	43.4	49.8	79.0	77.2	80.2	20.2	12.5	35.3	1906.....	14.5	3.6	3.4				40.4	59.8	14.9
Pacific coast (including Alaska):										1889.....	17.3	11.3	7.3				27.4	63.8	21.5
1916.....	14.6	11.6	13.2	9.9	19.0	21.9	8.2	5.1	8.3	All other inland waters:									
1906.....	10.7	12.8	15.6	9.3	17.9	20.5	4.0	2.2	7.2	1916.....	3.9	0.5	0.4	0.2	(2)	(2)	7.2	3.4	2.4
1889.....	8.3	9.4	11.2	8.6	11.7	11.7	2.9	1.3	3.7	1906.....	3.4	0.5	0.6	0.2	(2)	(2)	8.8	3.3	3.6
										1889.....	2.9	1.1	0.6	0.3	0.1	0.1	37.7	19.6	23.9

¹ Includes craft propelled by machinery.² Less than one-tenth of 1 per cent.

Although the vessels classed as steam increased their proportion of the total number of all classes of vessels from 26.6 per cent in 1906 to 38.5 per cent in 1916, more than one-half of the total number of craft were unrigged at both censuses. In tonnage, however, that for steam vessels formed 49.8 per cent of the total for all craft in 1916 as compared with 40.7 per cent for the unrigged. At both these censuses the value of the steam vessels was much greater, both absolutely and relatively, than that for any other class, being 76.1 per cent of the whole in 1906 and 83.6 per cent in 1916. Sailing vessels formed the smallest proportion in every detail shown in the table, decreasing from 19.1 per cent of the number in 1906 to 7.9 per cent in 1916; from 13.2 per cent of the tonnage to 9.6 per cent; and from 11.1 per cent of the value in 1906 to 6.3 per cent in 1916.

Absolute increases from 1906 to 1916 in all of the details reported in Table 7 for steam and unrigged vessels are shown for the Atlantic coast and Gulf of Mexico, for the Pacific coast, and for the Great Lakes, except for gross tonnage of unrigged vessels in the last-named division. The percentage of increase in number of steam vessels during the 10-year period was highest for the Pacific coast (including Alaska), and the relative increases for unrigged craft are greatest also for this division.

The Atlantic coast and Gulf of Mexico, for the three census years covered by Table 8, had the largest proportion of the number, tonnage (except in 1906), and value of steam vessels, its leadership in these respects increasing from 1889 to 1916. For instance, this division reported 45.3 per cent of the number of steam vessels in 1889 and 57.2 per cent in 1916. The Pacific coast also increased its proportion of the total number of steam vessels from 8.3 per cent in 1889 to 14.6 per cent in 1916. In the other details for steam vessels there was an increase in the proportions reported for these two divisions, and for the Pacific coast an increase in the proportion in all details for sailing vessels also, the other divisions, except the Great Lakes and St. Lawrence River, showing a decline in all details for unrigged craft and in tonnage of steam vessels. The proportion of the total tonnage of steam vessels reported for the Great Lakes division, however, decreased from 1906 to 1916, but was greater in 1916 than in 1889 by 4.7 per cent.

UNRIGGED CRAFT.

Table 9 shows the number, gross tonnage, and value of unrigged craft, for canal boats, and for all other unrigged vessels, for 1916 and 1906, with percentages of increase and per cent of total.

TABLE 9.—UNRIGGED VESSELS, BY OCCUPATION, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916 AND 1906.

OCCUPATION AND CENSUS YEAR.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Value of vessels.	Per cent of total.
Total:						
1916.....	20,311	100.0	4,981,254	100.0	\$97,219,760	100.0
1906.....	20,263	100.0	7,129,631	100.0	64,994,249	100.0
Per cent of increase ¹	0.2	.....	-30.1	.....	49.6	.....
Canal boats:						
1916.....	1,501	7.4	198,120	4.0	2,202,752	2.3
1906.....	2,237	11.0	303,581	4.3	2,952,197	4.5
Per cent of increase ¹	-32.9	.....	-34.7	.....	-25.4	.....
All other unrigged:						
1916.....	18,810	92.6	4,783,134	96.0	95,017,008	97.7
1906.....	18,026	89.0	6,826,050	95.7	62,042,052	95.5
Per cent of increase ¹	4.3	.....	-29.9	.....	53.1	.....

¹ A minus sign (—) denotes decrease.

The total number of unrigged craft at the censuses of 1906 and 1916 exceeded the total for steam and sail combined. The tonnage for the unrigged was similarly greater in 1906, but because of the large decrease in tonnage between the two censuses, it was second to steam in 1916. It is a noticeable coincidence that the actual decrease in the tonnage of unrigged vessels was about the same as the increase for the steam vessels.

The reduction in number and tonnage of canal boats is due largely to the decrease of such boats reported from the Erie Canal of New York state. This canal has been under enlargement for some years and in the meantime there has been a decreasing number of seaworthy boats suitable for canal service. A considerable number also that were formerly used on the canal have been withdrawn from this service and used in New York Harbor. A more complete analysis and explanation will be found in the discussion of Table 2 of the section on "Canals and other inland waters."

The reduction in tonnage of "all other unrigged" in the United States is due to the remarkable decrease in the Mississippi River division, which is explained in the text following Table 1 of the special section for that division.

Table 1 of the special section on canals shows that for recent years unrigged boats used exclusively, or for the most part, on canals have been a decreasing factor in connection with water-borne traffic.

The vessels classed as "all other unrigged" consist of barges, scows, etc., used for transporting coal and other freight between coast ports as well as on lakes and rivers and between points within. They are used also in loading or unloading steamers and other craft which do not come to the wharves, but receive cargoes in midstream, or lying off the coast.

Lighterage or harbor work is an important part of freight transportation, amounting in 1916 to 123,350,315 tons for the entire country. There are no figures strictly comparable for 1906, as the total for that year, estimated at 88,026,046 tons, did not include lighterage on the Great Lakes. The total for 1916, omitting the Great Lakes, was 117,262,269 tons. The lighterage for the Atlantic coast and Gulf of Mexico, most of which was reported for the harbor of New York, amounted to 101,267,073 tons in 1916, compared with 75,151,085 in 1906.

Unrigged craft generally are towed, and in such cases the income from freight carried or lightered was often credited to the tug or towing vessels. The same method was adopted for the employees and their wages, since comparatively few employees remain on barge or lighter, but usually operate with tug and tow. A better understanding, therefore, of the income for unrigged and towing vessels will be found in Table 43, where the two classes are combined.

SAILING VESSELS.

Table 10 shows the number, gross tonnage, and value of sailing vessels, classified as freight and passenger, yachts, and miscellaneous, with percentages of increase and per cent of total, 1916 and 1906.

Included in this class are not only the large vessels—ships, barks, barkentines, brigs, schooners, and the like—but all other craft propelled by or fitted with sails, whether pleasure yachts or boats devoted to miscellaneous purposes, such as piloting, policing, wrecking, etc.

The sailing vessels, which as a class show decreases in most items, present similar conditions when shown by what may be termed their occupation. With the single exception, that the value of those engaged in freight and passenger service shows an increase,

decreases prevailed in all other details contained in the table. The general loss appears greatest relatively among the boats devoted to miscellaneous purposes, nearly four-fifths in number and more than one-half in tonnage. The actual loss in number and in tonnage was naturally greatest in freight and passenger vessels, while the greatest actual decrease in value, \$2,228,740, was for yachts. Much of the decrease in sailing yachts, no doubt, is due to the installation of auxiliary power since 1906, thus placing them under steam vessels in the comparative tables. Owing to the great demand for freight and passenger vessels, the value of such vessels was \$6,857,693 more in 1916 than in 1906, notwithstanding a decrease of 2,824 in their number and 516,508 in tonnage.

TABLE 10.—SAIL VESSELS, BY OCCUPATION, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916 AND 1906.

OCCUPATION AND CENSUS YEAR.	Num-ber of ves-sels.	Per-cent of total.	Gross tonnage.	Per-cent of total.	Value of vessels.	Per-cent of total.
Total:						
1916.....	3,002	100.0	1,171,174	100.0	\$80,550,495	100.0
1906.....	7,131	100.0	1,704,277	100.0	56,206,145	100.0
Per cent of in-crease ¹	-57.9	.....	-31.3	.....	7.7	.....
Freight and passenger:						
1916.....	2,357	78.5	1,156,354	98.7	58,273,449	96.2
1906.....	5,181	72.7	1,672,862	98.2	51,415,756	91.5
Per cent of in-crease ¹	-54.5	.....	-30.9	.....	13.3	.....
Yachts:						
1916.....	569	19.0	11,387	1.0	1,940,513	3.2
1906.....	1,594	22.4	24,155	1.4	4,169,253	7.4
Per cent of in-crease ¹	-64.3	.....	-52.9	.....	-53.5	.....
Miscellaneous:						
1916.....	76	2.5	3,433	0.3	336,533	0.6
1906.....	356	5.0	7,260	0.4	621,136	1.1
Per cent of in-crease ¹	-78.7	.....	-52.7	.....	-45.8	.....

¹ A minus sign (—) denotes decrease.

Decreases in the number of sailing vessels and in the total amount paid in wages, which were notable during the 17 years from 1889 to 1906, as shown in Table 1, were even greater during the 10 years succeeding. At both census periods there was an increase in the value of sailing vessels. There was also a gain in the gross income of sailing vessels of 20.8 per cent during the 10-year period 1906–1916.

Table 11 shows the number, gross tonnage, value, gross income, number of employees, and salaries and wages for sailing vessels, by divisions, with per cent of increase, 1916, 1906, and 1889, and Table 12 shows the per cent in each division for the different items given in Table 11.

TABLE 11.—SAIL VESSELS,¹ BY DIVISIONS, WITH PER CENT OF INCREASE: 1916, 1906, AND 1889.

DIVISION AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number employed on vessels.	Wages.
Total:						
1916.....	3,002	1,171,174	\$60,550,495	\$39,497,728	14,037	\$7,396,621
1906.....	7,131	1,704,277	56,206,145	32,687,190	25,404	10,371,047
1889.....	7,945	1,675,706	53,192,972	48,278,366	43,523	12,961,592
Atlantic coast and Gulf of Mexico:						
1916.....	2,539	803,426	42,930,897	29,818,908	9,592	5,242,552
1906.....	5,920	1,132,905	37,520,903	20,042,015	18,654	6,687,314
1889.....	6,277	1,293,192	42,685,982	33,113,416	² 33,097	² 8,838,774
Pacific coast (including Alaska):						
1916.....	296	222,040	13,259,661	8,065,860	3,562	1,688,208
1906.....	666	305,283	11,533,171	8,299,751	4,481	2,719,571
1889.....	681	195,508	6,281,340	6,912,824	4,633	2,313,195
Great Lakes and St. Lawrence River:						
1916.....	162	145,450	4,351,287	1,611,810	878	464,581
1906.....	531	265,571	7,135,271	4,341,174	2,258	962,542
1889.....	962	185,081	4,238,850	8,240,645	5,758	1,804,003
All other inland waters:						
1916.....	5	258	8,650	1,150	5	1,280
1906.....	14	518	16,800	4,250	11	1,620
1889.....	25	1,925	36,800	11,481	35	5,620
PER CENT OF INCREASE. ³						
Total:						
1906-1916.....	-57.9	-31.3	7.7	20.8	-44.7	-28.7
1889-1916.....	-62.2	-30.1	13.8	-18.2	-67.7	-42.9
Atlantic coast and Gulf of Mexico:						
1906-1916.....	-57.1	-29.1	14.4	48.8	-48.6	-21.6
1889-1916.....	-59.6	-37.9	0.6	-9.9	-71.0	-40.7
Pacific coast (including Alaska):						
1906-1916.....	-55.6	-27.3	15.0	-2.8	-20.5	-37.9
1889-1916.....	-56.5	13.6	112.8	16.7	-23.1	-27.0
Great Lakes and St. Lawrence River:						
1906-1916.....	-69.5	-45.2	-39.0	-62.9	-61.1	-51.7
1889-1916.....	-83.2	-21.4	2.7	-80.4	-84.8	-74.2
All other inland waters:						
1906-1916.....		-50.2	-48.5	-72.9		-21.0
1889-1916.....		-86.6	-76.5	-90.0		-77.2

¹ Includes schooner barges, etc.² The employees and wages for yachts were not reported.³ A minus sign (-) denotes decrease. Percentages are omitted when base is less than 100.

TABLE 12.—SAIL VESSELS, PER CENT IN EACH DIVISION: 1916, 1906, AND 1889.

DIVISION AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number employed on vessels.	Wages.
Total:						
1916.....	100.0	100.0	100.0	100.0	100.0	100.0
1906.....	100.0	100.0	100.0	100.0	100.0	100.0
1889.....	100.0	100.0	100.0	100.0	100.0	100.0
Atlantic coast and Gulf of Mexico:						
1916.....	84.6	68.6	70.9	75.5	68.3	70.9
1906.....	83.0	66.5	66.8	61.3	73.4	64.5
1889.....	79.0	77.2	80.2	68.6	76.0	68.2
Pacific coast (including Alaska):						
1916.....	9.9	19.0	21.9	20.4	25.4	22.8
1906.....	9.3	17.9	20.5	25.4	17.6	26.2
1889.....	8.6	11.7	11.7	14.3	10.6	17.8
Great Lakes and St. Lawrence River:						
1916.....	5.4	12.4	7.2	4.1	6.3	6.3
1906.....	7.4	15.6	12.7	13.3	8.9	9.3
1889.....	12.1	11.0	8.0	17.1	13.2	13.9
All other inland waters:						
1916.....	0.2	(¹)	(¹)	(¹)	(¹)	(¹)
1906.....	0.2	(¹)	(¹)	(¹)	(¹)	(¹)
1889.....	0.3	0.1	0.1	(¹)	0.1	(¹)

¹ Less than one-tenth of 1 per cent.

The greatest absolute decreases from 1906 to 1916 in the number and tonnage of sailing vessels, 3,381 and 329,479, respectively, are shown for the Atlantic coast and Gulf of Mexico division, but the Great Lakes and St. Lawrence River shows the greatest proportionate decrease in number, 69.5 per cent, while "All other inland waters" shows a decrease in tonnage of 50.2 per cent. Increases of \$5,409,994 and \$9,776,893, representing 14.4 and 48.8 per cent, respectively, in the value and gross income of vessels operating on the

Atlantic coast and Gulf of Mexico are noteworthy, since they represent the only gains shown in the table for this period, except one of \$1,726,490, or 15 per cent, in the value of vessels reported from the Pacific coast (including Alaska).

The actual decrease in value of sailing vessels during the 10-year period 1906 to 1916 was greatest in the Great Lakes and St. Lawrence River, \$2,783,984, or 39 per cent. The absolute loss in gross income, \$2,729,364, or 62.9 per cent, was greatest also in this division. The greatest relative decreases in the number employed on vessels and their wages, 61.1 and 51.7 per cent, respectively, are shown for the Great Lakes.

At none of the three censuses were sailing vessels reported for the Mississippi River and its tributaries and, as will be seen by the table, those on inland waters other than the Great Lakes, classed as "All other inland waters," have been increasingly insignificant.

Naturally, because of its extensive coast line and important harbors, the Atlantic and Gulf division shows much the greatest proportion of sailing vessels. The proportion, however, for the Pacific coast shows a general increase at each census since that of 1889.

SCHOONER BARGES.

These vessels, although fitted with sails, in their uses differ little from the ordinary barges used for handling freight, since they are still dependent upon their tow, the chief use of the sails being for their pro-

tection in case of breaking away from the tugs, or perhaps, with a fair wind, adding something to the speed of the tow.

The statistics for schooner barges are shown separately in Table 13 for 1916 and 1906:

TABLE 13.—SCHOONER BARGES: 1916 AND 1906.

	Total.	Atlantic coast and Gulf of Mexico.	Pacific coast (including Alaska).	Great Lakes and St. Lawrence River.
Number of vessels:				
1916.....	381	309	13	59
1906.....	515	389	9	117
Gross tonnage:				
1916.....	409,563	312,827	5,469	91,267
1906.....	492,697	323,618	9,077	160,002
Value of vessels:				
1916.....	\$10,520,874	\$16,274,554	\$437,000	\$2,809,320
1906.....	\$13,263,423	\$7,497,833	\$491,708	\$5,273,884
Number employed on vessels:				
1916.....	2,026	1,481	79	466
1906.....	2,300	1,458	74	768
Wages:				
1916.....	\$1,107,775	\$798,648	\$50,246	\$258,881
1906.....	\$1,115,136	\$721,911	\$53,024	\$340,201

At the census of 1906 there were 515 schooner barges reported for the country as a whole, and in 1916 but 381. There was a decrease of 80 on the Atlantic and Gulf coasts and 58 on the Great Lakes,

but a small increase of 4 on the Pacific coast, making a net decrease of 134 for the entire country. The gross tonnage of this class shows a decrease of 83,134 tons from 1906 to 1916. Of this decrease, 68,735 tons were reported for the Great Lakes, while that for the Atlantic coast was but 10,791 tons. The Pacific coast also shows a loss of 3,608 in this tonnage, notwithstanding the small gain in number of such vessels. Although the value of vessels is more or less a fluctuating figure, it is noticeable that while the value of schooner barges on the Great Lakes and St. Lawrence River decreased \$2,464,564, or 46.7 per cent, the value of these barges on the Atlantic coast increased \$8,776,721, or 117.1 per cent.

In connection with the statistics for schooner barges, it is suggested that barges reported as unrigged in 1906 may have been fitted with sails in 1916, while others having sails and classed as schooners in 1906 may have been dismasted and reported as barges at the later census.

FERRYBOATS.

Table 14 presents the general statistics for ferryboats, by divisions, for 1916, 1906, and 1889, with percentages of increase.

TABLE 14.—FERRYBOATS, BY DIVISIONS, WITH PER CENT OF INCREASE: 1916, 1906, AND 1889.

DIVISION AND CENSUS YEAR.	Number of vessels. ¹	Gross tonnage.	Value of vessels.	GROSS INCOME.			Number employed on vessels.	Wages.	Number of passengers carried. ¹
				Total.	Passenger.	All other sources.			
Total:									
1916.....	611	224,328	\$23,227,174	\$15,414,979	\$10,223,408	\$5,191,571	4,282	\$3,947,836	292,177,374
1906.....	536	261,073	29,578,380	17,291,073	10,414,106	6,876,967	4,519	3,537,180	330,737,639
1889.....	456	146,104	10,442,750	(²)	(²)	(²)	(²)	(²)	182,033,991
Atlantic coast and Gulf of Mexico:									
1916.....	262	153,818	14,664,863	10,318,559	6,671,823	3,646,736	2,549	2,437,826	218,045,127
1906.....	270	162,834	19,970,466	10,571,534	7,386,913	3,184,621	2,388	2,098,540	272,596,670
1889.....	214	98,174	7,907,700	5,392,969			1,710	1,276,847	158,644,012
Pacific coast (including Alaska):									
1916.....	76	51,480	6,607,936	3,259,556	2,216,001	1,043,555	825	964,080	48,280,569
1906.....	47	40,171	4,315,522	4,208,430	2,037,580	2,170,850	759	708,777	39,532,354
1889.....	38	24,630	979,300	994,476			478	395,157	14,291,859
Great Lakes and St. Lawrence River:									
1916.....	43	7,264	874,675	718,215	634,180	34,035	312	186,745	13,290,770
1906.....	48	35,581	3,429,532	922,838	456,856	465,982	656	308,156	8,264,482
1889.....	40	4,702	498,000	(²)	(²)	(²)	(²)	(²)	623,474
Mississippi River and its tributaries:									
1916.....	213	11,263	1,014,950	1,060,470	631,113	429,357	572	346,116	12,390,740
1906.....	166	22,180	1,776,360	1,553,121	498,747	1,054,374	699	413,553	10,022,612
1889.....	163	18,593	1,056,250	1,196,817			893	456,676	8,474,646
All other inland waters:									
1916.....	17	503	64,750	58,179	20,291	37,888	24	13,069	170,168
1906.....	5	307	86,500	35,150	34,010	1,140	17	8,154	321,521
1889.....	1	5	1,500	(²)	(²)	(²)	(²)	(²)	(²)
PER CENT OF INCREASE. ³									
Total:									
1906-1916.....	14.0	-14.1	-21.5	-10.9	-1.8	-24.5	-5.2	11.6	-11.7
1889-1916.....	34.0	53.5	122.4						60.5
Atlantic coast and Gulf of Mexico:									
1906-1916.....	-3.0	-5.5	-26.6	-2.4	-9.7	14.5	6.7	16.2	-20.0
1889-1916.....	22.4	56.7	85.5	91.3			49.1	90.9	37.4
Pacific coast (including Alaska):									
1906-1916.....		28.2	53.1	-22.5	8.8	-51.9	8.7	36.0	22.1
1889-1916.....		109.0	574.8	227.8			72.6	144.0	237.8
Great Lakes and St. Lawrence River:									
1906-1916.....		-79.6	-74.5	-22.2	49.8	-92.7	-52.4	-39.4	60.8
1889-1916.....		54.5	75.6						(⁴)
Mississippi River and its tributaries:									
1906-1916.....	28.3	-49.2	-42.9	-31.7	26.5	-59.3	-18.2	-16.3	23.6
1889-1916.....	30.7	-39.4	-3.9	-11.4			-35.9	-24.2	46.2
All other inland waters:									
1906-1916.....		63.8	-25.1	65.5	-40.3	3,223.5		60.3	-47.1
1889-1916.....	(⁴)	(⁴)	(⁴)						

¹ Car ferries, on which the cars containing the passengers were carried, were often included with ferryboats in 1906. In 1916 this class was included with freight and passenger vessels.

² Not reported separately for ferryboats in 1889.

³ A minus sign (-) denotes decrease. Percentages are omitted when base is less than 100.

⁴ Percentages omitted where figures are known not to be comparable.

At the census of 1916 statistics for car ferries—that is, ferryboats carrying loaded passenger cars from one point to another on through railroad lines—have been included with the statistics for freight and passenger vessels. In 1906 such passengers were often included with those for regular ferryboats; comparison, therefore, in this respect with totals for 1906 should be accepted with this understanding.

The figures in Table 14 show decreases from 1906 to 1916 in the totals for the United States in all particulars, except number of ferryboats and salaries and wages of employees. During this period there was a decrease of 38,560,265, or 11.7 per cent, in the total number of ferry passengers carried. This loss is wholly attributable to decreases in the number reported for the Atlantic coast and Gulf of Mexico and for "All other inland waters," since the other divisions show increases in this respect. The decrease is no doubt due to the underharbor and underriver tunnels and to bridges placed in operation since 1906. The two divisions named show a total decrease of 54,702,896 passengers, of which 54,551,543, or 99.7 per cent, were reported for the Atlantic coast and Gulf of Mexico.

Notwithstanding the pronounced decrease shown for the Atlantic coast and Gulf of Mexico, this division reported 74.6 per cent of the total number of ferryboat passengers and 66.9 per cent of the gross income. In 1906 these proportions were 82.4 and 61.1 per cent, respectively. The average receipt per passenger in 1916 was about 3 cents; in 1906 it was a little less

than 3. These rates are much lower than those shown for any other division in either year. The average rate for the Pacific coast, including Alaska, was about 5 cents for 1916 and a little more than 5 for 1906; for the Great Lakes and St. Lawrence River, about 5 for the later year, compared with 5½ for the earlier; for the Mississippi River and its tributaries, practically 5 cents at both censuses; and for "All other inland waters," nearly 12 and 11 cents, respectively. These averages, of course, show only in the most general way the differences in rates between the several divisions.

It must be remembered that various classes of ferries are included in these figures, those operated by municipalities, as well as those operated by corporations or other organizations, and those also under individual ownership.

As shown in Table 3, the ferryboats owned and operated by railroad companies, exclusive of those operating on through traffic routes, transporting cars as well as passengers, numbered 114, with a gross tonnage of 123,054, a valuation of \$13,660,175, and a gross income of \$8,232,054. The number of passengers carried by these railroad-owned ferries in 1916, although not shown in Table 3, was 182,542,819. Statistics for such ferries were not shown separately at the census of 1906.

Some of the decreases shown by geographic divisions in Table 14 are more closely localized in Table 15, which shows details for five important municipal districts and for "all other districts," combined.

TABLE 15.—FERRYBOATS, BY DISTRICTS, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916 AND 1906.

DISTRICT.	Cen- sus year.	Num- ber of ves- sels.	Gross tonnage.	Value of vessels.	Gross income.	Num- ber em- ployed on ves- sels.	Wages.	Number of passengers carried.	PER CENT OF TOTAL.						
									Num- ber of ves- sels.	Gross ton- nage.	Value of ves- sels.	Gross in- come.	Num- ber em- ployed on ves- sels.	Wages.	Num- ber of pas- sengers car- ried.
Total.....	1916	611	224,328	\$23,227,174	\$15,414,979	4,282	\$3,947,836	292,177,374	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Per cent of increase ¹	1906	536	261,073	29,578,380	17,291,073	4,519	3,537,180	330,737,639	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		14.0	-14.1	-21.5	-10.9	-5.2	11.6	-11.7							
New York.....	1916	125	115,363	11,406,584	7,118,972	1,600	1,669,473	144,190,729	20.5	51.4	49.1	46.2	37.4	42.3	49.4
Per cent of increase ¹	1906	152	129,690	17,098,677	8,423,119	1,622	1,578,839	208,684,123	28.4	49.7	57.8	48.7	35.9	44.6	63.1
		-17.8	-11.0	-33.3	-15.5	-1.4	5.7	-30.9							
Philadelphia.....	1916	19	10,962	1,036,459	1,251,163	228	230,962	34,662,070	3.1	4.9	4.5	8.1	5.3	6.9	11.9
Per cent of increase.....	1906	25	10,306	918,867	1,009,295	217	195,560	30,616,853	4.7	3.9	3.1	5.8	4.8	5.5	9.3
			6.4	12.8	24.0	5.1	18.1	13.2							
New Orleans.....	1916	9	2,768	164,710	300,990	96	78,656	5,471,300	1.5	1.2	0.7	2.0	2.2	2.0	1.9
Per cent of increase ¹	1906	11	1,598	214,000	154,415	65	25,467	3,524,470	2.1	0.6	0.7	0.9	1.4	0.7	1.1
			73.2	-23.0	94.9		208.9	55.2							
San Francisco.....	1916	28	43,846	5,799,857	2,786,849	607	757,485	40,774,965	4.6	19.5	25.0	18.1	14.2	19.2	14.0
Per cent of increase ¹	1906	26	35,273	3,415,498	3,924,040	636	598,277	34,905,968	4.9	13.5	11.5	22.7	14.1	16.9	10.6
			24.3	69.8	-29.0	-4.6	26.6	16.8							
Detroit.....	1916	18	5,192	646,876	567,719	195	124,566	11,536,607	2.9	2.3	2.8	3.7	4.6	3.2	3.9
Per cent of increase ¹	1906	17	15,649	1,944,882	351,490	308	176,169	6,612,216	3.2	6.0	6.6	2.0	6.8	5.0	2.0
			-66.8	-66.7	61.5	-36.7	-29.3	74.5							
All other districts.....	1916	412	46,197	4,172,688	3,389,286	1,556	1,086,694	55,541,703	67.4	20.6	18.0	22.0	36.3	27.5	19.0
Per cent of increase ¹	1906	305	68,557	5,986,456	3,428,714	1,671	962,868	46,394,009	56.9	26.3	20.2	19.8	37.0	27.2	14.0
		35.1	-32.6	-30.3	-1.1	-6.9	12.9	19.7							

¹ A minus sign (-) denotes decrease. Percentages are omitted when base is less than 100.

Ferry traffic in 1916 in the New York district was much greater than in any other locality in the United States. More than one-half of the gross tonnage of all ferryboats and nearly that proportion of the passengers carried were reported from this district, while the value of its ferry fleet and the amount of its gross income represented nearly one-half of the corresponding totals for the entire country.

Next to New York, the greatest passenger-carrying district in 1916 was San Francisco, followed by Philadelphia. Of the several districts shown in the table, New Orleans reported the least number of passengers carried, but the gain was marked, 1,946,830, or 55.2 per cent, the relative gain being exceeded only by

Detroit, which shows an increase of 4,924,391, or 74.5 per cent.

The table shows that, notwithstanding San Francisco's great gain in passenger traffic, the gross income decreased \$1,137,191, or 29 per cent. This loss, as shown in Table 14, was in receipts from "all other sources" and not in the passenger accounts.

"All other districts" is made up of widely separated sections of the country, embracing, for instance, Boston, Mass.; Norfolk, Va.; Portland, Oreg.; and Seattle, Wash.

Municipal ferries.—Table 16 presents statistics for ferries located in municipalities that reported such ferries in 1916 and 1906.

TABLE 16.—MUNICIPAL FERRIES, WITH PER CENT OF INCREASE: 1916 AND 1906.

DISTRICT.	Census year.	Number of vessels.	Gross tonnage.	Value of vessels.	GROSS INCOME.		Number employed on vessels.	Wages.	Number of passengers carried.
					Passengers.	All other sources.			
Total.....	1916	29	21,545	\$2,399,498	\$743,882	\$468,413	496	\$564,502	24,459,321
Per cent of increase ¹	1906	29	20,238	2,503,447	621,280	263,672	290	458,129	20,945,055
			6.5	-4.2	19.7	77.6	71.0	23.2	16.8
New York Harbor.....	1916	16	15,471	2,107,199	696,353	419,219	364	413,908	18,748,804
Per cent of increase ¹	1906	16	14,829	2,253,000	557,437	220,905	188	360,159	12,621,847
			4.3	-6.5	24.9	89.8	93.6	14.9	49.7
Boston Harbor.....	1916	7	4,728	208,986	46,284	47,341	84	99,445	4,628,352
Per cent of increase ¹	1906	7	4,448	209,347	62,373	41,037	72	70,720	7,242,808
			6.3	-0.2	-25.8	15.4		40.6	-36.1
Small points on Connecticut River.....	1916	2	110	9,000	1,245	1,853	4	3,596	25,111
Per cent of increase.....	1906	2	60	4,100	970	1,230	4	2,150	19,400
				119.5	28.4	50.7		67.3	29.4
Portland, Oreg.....	1916	4	1,236	74,313	(²)	(²)	44	47,553	1,057,064
Per cent of increase ¹	1906	3	857	35,000	(²)	(²)	25	24,900	1,156,000
			44.2	112.3				91.0	-8.6
Wabasha, Minn.....	1906	^a 1	44	2,000	500	500	1	200	5,000

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

² Free ferries operated by city of Portland.

^a This ferryboat was dismantled in 1915 and ferry discontinued.

The only municipality, of those reporting at both censuses, which shows a change in the number of ferryboats is Portland, Oreg., which city reported four in 1916 and but three in 1906. This gain of one is offset by the abandonment since 1906 of the municipal ferry at Wabasha, Minn., so that the total number of these boats reported for municipalities remains the same at the two censuses.

Of the municipal ferries reported for New York Harbor, seven were operated in connection with penal and eleemosynary institutions, and on these ferries no regular fare was charged. Although there was an increase in the gross tonnage of the municipal ferries in New York Harbor, a decrease is shown in their value, the average tonnage value shrinking from \$152 in 1906 to \$136 in 1916. Notwithstanding this decrease in the value of the municipal ferryboats in New York Harbor, there was an increase of 24.9 per cent in the

receipts from passengers and of 49.7 per cent in the number carried.

The notable decrease in the number of passengers carried by the municipal ferries of Boston may be due largely to the increased efficiency of the electric service through the tunnel under the harbor between East Boston and the city proper.

In addition to the municipal ferries shown in Table 16, for the same cities in 1916 as in 1906, Table 17 shows that in 1916 there were 11 other ferryboats of this character, 2 in Baltimore, 4 in Seattle, and 5 in other districts, making a total of 40 municipal ferryboats in 1916 as compared with 29 in 1906.

The increase of 11, or 37.9 per cent, in the number of these ferryboats, from 1906 to 1916, was accompanied by substantial increases in other respects also, the tonnage increasing 24.7 per cent, the gross income 48.9 per cent, and the number of passengers carried 26.7 per cent.

TABLE 17.—MUNICIPAL FERRIES: 1916.

DISTRICT.	Number of vessels.	Gross tonnage.	Value of vessels.	GROSS INCOME.		Number employed on vessels.	Wages.	Number of passengers carried.
				Passengers.	All other sources.			
Total.....	40	25,230	\$2,755,322	\$319,874	\$497,899	570	\$638,785	26,533,297
New York Harbor.....	16	15,471	2,107,199	696,353	419,219	364	413,908	18,748,804
Boston Harbor.....	7	4,728	208,986	46,284	47,341	84	99,445	4,628,352
Baltimore Harbor.....	2	630	20,000	13,201	2,127	8	5,724	609,939
Small points on Connecticut River.....	2	110	9,000	1,245	1,853	4	3,596	25,111
Seattle, Wash.....	4	2,435	309,324	53,295	26,859	54	57,229	1,400,595
Portland, Oreg.....	4	1,236	74,313	(1)	(1)	44	47,553	1,057,064
All other districts.....	5	620	26,500	4,496	500	12	11,330	163,432

¹ Free ferries operated by city of Portland.

YACHTS, STEAM AND SAIL.

Table 18 shows the number, gross tonnage, and value of steam and sail yachts, by divisions, for 1916 and 1906, with percentages of increase.

The most noticeable feature of this table is the decrease during the ten-year period of 1,025, or 64.3

per cent, in the number of yachts dependent wholly upon sails for propelling power. This decrease no doubt is due chiefly to the large number of yachts that have been fitted with motors since 1906, as all vessels equipped with auxiliary power of any kind are classed as "steam" or "motor" in all tables of this report.

TABLE 18.—YACHTS, NUMBER, GROSS TONNAGE, AND VALUE, BY DIVISIONS, WITH PER CENT OF INCREASE: 1916 AND 1906.

DIVISION AND CLASS.	NUMBER OF VESSELS.		GROSS TONNAGE.		VALUE OF VESSELS.		PER CENT OF INCREASE, ¹ 1906-1916.		
	1916	1906	1916	1906	1916	1906	Number of vessels.	Gross tonnage.	Value of vessels.
Total.....	4,354	3,770	123,007	106,430	\$35,387,656	\$28,451,114	15.5	15.6	24.4
Steam ²	3,785	2,176	111,620	82,275	33,447,143	24,281,861	73.9	35.7	37.7
Sail.....	569	1,594	11,387	24,155	1,940,513	4,169,253	-64.3	-52.9	-53.5
Atlantic coast and Gulf of Mexico.....	3,082	2,935	91,946	91,507	27,382,512	25,066,082	5.0	0.5	9.2
Steam.....	2,587	1,577	81,766	70,461	25,630,224	21,290,339	64.0	16.0	20.2
Sail.....	495	1,358	10,180	21,046	1,792,288	3,775,743	-63.5	-51.6	-52.5
Pacific coast (including Alaska).....	322	170	9,009	2,524	2,211,062	468,910	89.4	266.9	371.5
Steam.....	293	66	8,417	1,065	2,139,937	294,800	.....	690.3	625.9
Sail.....	29	104	592	1,459	71,125	174,110	-72.1	-59.4	-59.1
Great Lakes and St. Lawrence River.....	501	358	13,619	7,668	4,237,710	1,877,850	39.9	77.6	125.7
Steam.....	459	236	13,124	6,210	4,167,560	1,673,000	94.5	111.3	149.1
Sail.....	42	122	495	1,458	70,150	204,850	-65.6	-66.0	-65.8
Mississippi River and its tributaries.....	325	222	6,429	3,255	1,206,153	563,400	46.4	97.5	114.1
Steam.....	325	222	6,429	3,255	1,206,153	563,400	46.4	97.5	114.1
Sail.....									
Canals and other inland waters of New York state.....	35	41	791	810	166,400	276,450	.....	-2.3	-39.8
Steam.....	32	32	671	641	159,450	262,700	.....	4.7	-39.3
Sail.....	3	9	120	169	6,950	13,750	.....	-20.0	-49.5
All other inland waters.....	89	44	1,213	666	183,819	198,422	.....	82.1	-7.4
Steam.....	89	43	1,213	643	183,819	197,622	.....	88.6	-7.0
Sail.....		1		23		800	.....	

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.² Includes all yachts propelled by machinery.

The Mississippi River and its tributaries are not favorable to the operation of sailing vessels of 5 tons and over, of which cognizance only is taken by the census, and no sail yachts were reported for either census from that division. There were none reported in 1916 for "All other inland waters," although one of 23 tons was shown in 1906. At both censuses, however, a small number was reported on the "Canals and other inland waters of New York state." The relative losses in sail yachts were greatest in those operating on the Pacific coast and the Great Lakes.

All divisions show increases for steam yachts in the several particulars, except that for "Canals and other inland waters of New York state" and "All other inland waters" there was a decrease in

the value of these vessels. It should be remembered, however, that the value of a yacht is that given by the owner and can hardly be taken in a commercial sense. Of the gain in number of steam yachts for the United States (1,609, or 73.9 per cent), 1,010, or 62.8 per cent, is shown for the Atlantic coast and Gulf of Mexico division. So also of the total gain in tonnage for this class (29,345, or 35.7 per cent), the Atlantic coast division reported 11,305 tons, or 38.5 per cent. This division was first likewise in gain in values, showing an increase of \$4,299,885, or 46.9 per cent of the total increase of \$9,165,282 reported for the United States.

The second greatest actual increase in the number of steam yachts was 227 in the Pacific coast division. Very close to this, however, was the increase in the

number reported for the Great Lakes and St. Lawrence River—223, or 13.9 per cent of the total increase for this class in the United States. The Great Lakes division was second in actual increase in value of steam yachts, \$2,494,560, or 27.2 per cent of the total increase, the Pacific coast being third in this respect, with an increase of \$1,845,137, or 20.1 per cent of the total. Second place in actual gain in tonnage, 7,352, or 25.1 per cent of the total for the United States, is accorded the Pacific coast; third place belongs to the Great Lakes, with an increase of 6,914 tons, or 23.6 per cent of the total.

The importance of the several divisions as to their proportions of the number, tonnage, and value of steam and of sail yachts is presented in Table 19 for 1916 and 1906.

TABLE 19.—YACHTS, PER CENT OF TOTAL NUMBER, GROSS TONNAGE, AND VALUE, BY DIVISIONS AND CLASS: 1916 AND 1906.

DIVISION AND CENSUS YEAR.	PER CENT OF TOTAL.					
	Number of vessels.		Gross tonnage.		Value of vessels.	
	Steam.	Sail.	Steam.	Sail.	Steam.	Sail.
Total:						
1916.....	100.0	100.0	100.0	100.0	100.0	100.0
1906.....	100.0	100.0	100.0	100.0	100.0	100.0
Atlantic coast and Gulf of Mexico:						
1916.....	68.3	87.0	73.3	89.4	76.5	92.4
1906.....	72.5	85.2	85.6	87.1	87.7	90.6
Pacific coast (including Alaska):						
1916.....	7.7	5.1	7.5	5.2	6.4	3.7
1906.....	3.0	6.5	1.3	6.0	1.2	4.2
Great Lakes and St. Lawrence River:						
1916.....	12.1	7.4	11.8	4.3	12.5	3.6
1906.....	10.8	7.7	7.5	6.0	6.9	4.9
Mississippi River and its tributaries:						
1916.....	8.6	-----	5.8	-----	3.6	-----
1906.....	10.2	-----	4.0	-----	2.3	-----
Canals and other inland waters of New York state:						
1916.....	0.8	0.5	0.6	1.1	0.5	0.4
1906.....	1.5	0.6	0.8	0.7	1.1	0.3
All other inland waters:						
1916.....	2.4	-----	1.1	-----	0.5	-----
1906.....	2.0	0.1	0.8	0.1	0.8	(¹)

¹ Less than one-tenth of 1 per cent.

GOVERNMENT VESSELS.

Table 20 shows certain statistics for vessels owned and operated by state and city governments in 1916 and 1906.

The government vessels here included are only those belonging to or operated by state and city governments. Vessels owned or operated by the Federal Government are not included in these statistics. The vessels owned or operated by state and city governments are used for a great variety of purposes, chiefly for ferriage of the general public and in connection with penal and charitable institutions, for disposing of garbage, for dredging, for fire and police service, for ice breaking, for scientific investigation, canal inspection, and for the protection of fish and game. The statistics for all classes of these vessels combined show an increase for the decade in all totals except for income, which factor is neces-

sarily more or less of a fluctuating character, since only a portion of the vessels can properly be classed as a business enterprise in this respect.

TABLE 20.—VESSELS OWNED AND OPERATED BY STATE AND CITY GOVERNMENTS: 1916 AND 1906.

	Total.	Steam. ¹	Sail.	Unrigged.
Number of vessels:				
1916.....	474	229	2	243
1906.....	315	143	4	168
Per cent of increase.....	50.5	60.1	-----	44.6
Gross tonnage:				
1916.....	82,888	45,593	70	37,225
1906.....	62,739	36,099	132	26,508
Per cent of increase ²	32.1	26.3	-47.0	40.4
Value of vessels:				
1916.....	\$11,147,275	\$8,954,652	\$6,500	\$2,186,123
1906.....	\$8,040,696	\$6,803,468	\$10,380	\$1,226,848
Per cent of increase ²	38.6	31.6	-37.4	78.2
Gross income:				
1916.....	³ \$2,487,292	\$1,607,940	\$5,000	\$874,352
1906.....	³ \$3,177,554	\$1,136,594	-----	\$2,040,960
Per cent of increase ²	-21.7	41.5	-----	-57.2
Number employed on vessels:				
1916.....	2,565	2,019	6	540
1906.....	1,884	1,150	12	722
Per cent of increase ²	36.1	75.6	-----	-25.2
Wages:				
1916.....	\$2,635,106	\$2,270,390	\$3,810	\$360,906
1906.....	\$2,073,028	\$1,308,332	\$5,470	\$759,226
Per cent of increase ²	27.1	73.5	-30.3	-52.5
Number of passengers carried:				
1916.....	26,598,701	26,544,597	-----	54,104
1906.....	21,344,209	21,344,209	-----	-----
Per cent of increase.....	24.6	24.4	-----	-----

¹ Includes craft propelled by machinery.

² A minus sign (-) denotes decrease. Percentages are omitted when base is less than 100.

³ Includes value of work done by craft of the department of docks and ferries, New York City.

In 1916, as in 1906, the great bulk of activity connected with these craft was on the Atlantic and Gulf coasts, although this division reported a smaller proportion of the total number in 1916 than in 1906, this proportion being 56.5 per cent for the later census as compared with 67.7 per cent for the earlier. (See Table 10 of the Atlantic coast and Gulf of Mexico division.) In its proportion of the gross tonnage there was little change, 73.7 per cent and 73.2 per cent in 1906 and 1916, respectively, and in the number of passengers carried the decrease in proportion was small, from 94.6 to 90 per cent. In other respects, however, the decreased proportion for this division in 1916 was pronounced, the proportion for income decreasing from 92 to 64 per cent and that for the value of such vessels from 76.7 to 64.4 per cent.

COMMERCIAL FISHING CRAFT.

Statistics for vessels engaged in the fisheries, by divisions, for 1916 are given in Table 21.

At the census of 1906 reports were not secured for vessels or craft engaged in the fisheries, and there are no figures for that year, therefore, with which the statistics for 1916 may be compared.

The Atlantic coast division occupied a predominant position in the fisheries, reporting 71.5 per cent of the total number of vessels, 72.7 per cent of the tonnage, and 72.5 per cent of the income. The table shows that the Pacific coast was second and the Great Lakes third. The other two divisions were insignificant in all respects pertaining to the fisheries.

TRANSPORTATION BY WATER.

TABLE 21.—FISHING VESSELS, BY DIVISIONS, WITH PER CENT OF TOTAL: 1916.

DIVISION.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number employed on vessels.	Wages.
United States.....	5,216	145,246	\$19,463,269	\$25,388,520	25,975	\$11,875,357
Atlantic coast and Gulf of Mexico.....	3,729	105,580	13,040,125	18,405,088	19,246	8,475,736
Per cent of total.....	71.5	72.7	67.0	72.5	74.1	71.4
Pacific coast (including Alaska).....	870	29,342	5,214,278	4,814,991	4,890	2,428,822
Per cent of total.....	16.7	20.2	26.8	19.0	18.8	20.5
Great Lakes and St. Lawrence River.....	606	10,196	1,190,866	2,129,489	1,807	949,562
Per cent of total.....	11.6	7.0	6.1	8.4	7.0	8.0
Mississippi River and its tributaries.....	8	92	14,400	26,110	26	16,227
Per cent of total.....	0.2	0.1	0.1	0.1	0.1	0.1
All other inland waters.....	3	36	3,600	12,842	6	5,010
Per cent of total.....	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)

¹ Less than one-tenth of 1 per cent.

Fishing vessels propelled by steam, which in Table 22 includes all craft propelled by machinery, constituted about two-thirds of both the total number and total tonnage reported for the United States. All sailing vessels engaged in the fisheries were reported from the

Atlantic coast and the Gulf of Mexico, and from the Pacific coast (including Alaska). Of a total of 1,738 sailing vessels of 48,565 gross tonnage, the Atlantic coast division reported 1,718, totaling 44,524 gross tons or 98.8 and 91.7 per cent, respectively.

TABLE 22.—FISHING VESSELS, GROUPED ACCORDING TO GROSS TONNAGE, BY DIVISIONS: 1916.

DIVISION AND CLASS.	TOTAL.		5 TO 49 TONS.		50 TO 99 TONS.		100 TO 199 TONS.		200 TO 299 TONS.		300 TO 399 TONS.		400 TO 499 TONS.		500 TO 999 TONS.	
	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.
United States.....	5,216	145,246	4,623	69,660	274	19,584	232	30,641	55	13,844	26	8,508	4	1,770	2	1,239
Steam ¹	3,478	96,681	3,112	47,711	177	12,589	117	15,859	51	12,820	16	5,161	3	1,302	2	1,239
Sail.....	1,738	48,565	1,511	21,949	97	6,995	115	14,782	4	1,024	10	3,347	1	468	.....	.....
Atlantic coast and Gulf of Mexico.....	3,729	105,580	3,260	46,114	200	14,703	203	26,544	46	11,494	17	5,342	2	883	1	500
Steam.....	2,011	61,056	1,756	24,274	103	7,708	90	12,087	46	11,494	13	4,110	2	883	1	500
Sail.....	1,718	44,524	1,504	21,840	97	6,995	113	14,457	.....	.....	4	1,232	.....	.....	.....	.....
Pacific coast (including Alaska).....	870	29,342	765	14,419	55	3,684	29	4,097	9	2,350	9	3,166	2	887	1	739
Steam.....	850	25,301	758	14,310	55	3,684	27	3,772	5	1,326	3	1,051	1	419	1	739
Sail.....	20	4,041	7	109	.....	.....	2	325	4	1,024	6	2,115	1	468	.....	.....
Great Lakes and St. Lawrence River.....	606	10,196	587	8,999	19	1,197	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Steam.....	606	10,196	587	8,999	19	1,197	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mississippi River and its tributaries.....	8	92	8	92	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Steam.....	8	92	8	92	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other inland waters.....	3	36	3	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Steam.....	3	36	3	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

¹ Includes all fishing vessels propelled by machinery.

Of the total number of fishing vessels reported in 1916, 4,897, or 93.9 per cent, were of less than 100 gross tons, and their tonnage, 89,244, while less proportionately, constituted 61.4 per cent. Of the steam vessels, 3,289, or 94.6 per cent, were of less than 100 tons burden, their aggregate tonnage being 60,300, or 62.4 per cent, not materially different from the proportions for both classes combined. The sailing vessels of less than 100 tons show similar proportions, there being in this class 1,608, or 92.5 per cent, with a tonnage of 28,944, or 59.6 per cent. All of the fishing vessels of 100 gross tons and over were reported for the Atlantic coast and the Pacific coast divisions, the former reporting 269 with a total gross tonnage of 44,763, and the latter, 50 vessels of 11,239 tonnage. From these figures it appears that the Atlantic coast reported 84.3 per cent of the number and 79.9 per cent of the tonnage of all fishing vessels of 100 gross tons and over. The largest single steam and also sail fishing vessels were returned from the Pacific coast, of 739 and 468 tons, respectively.

A number of vessels of the fishing fleet were engaged to some extent in carrying freight in 1916, probably during the off season for fishing, and the quantity of this freight for three of the divisions is presented in Table 23.

TABLE 23.—FREIGHT CARRIED BY FISHING VESSELS: 1916.

[Tons of 2,000 pounds.]

COMMODITY.	Total	Atlantic coast and Gulf of Mexico.	Pacific coast (including Alaska).	Great Lakes and St. Lawrence River.
Total.....	80,048	76,396	2,149	1,503
Canned goods.....	4,365	4,240	15	110
Cement, brick, and lime.....	1,147	1,127	20	.....
Coal.....	4,463	4,313	.....	150
Cotton.....	47	47	.....	.....
Flour.....	330	227	1	102
Fruits and vegetables.....	18,717	18,422	86	209
Grain.....	5,456	5,230	106	120
Ice.....	322	322	.....	.....
Iron ore.....	69	69	.....	.....
Lumber.....	11,470	11,063	254	163
Naval stores.....	275	275	.....	.....
Petroleum and other oils.....	714	699	.....	16
Phosphate and fertilizer.....	9,785	9,785	.....	.....
Stone, sand, etc.....	640	640	.....	.....
Miscellaneous merchandise.....	22,248	19,937	1,667	644

GEOGRAPHIC DIVISIONS.

As in prior censuses the statistics are presented for five geographic divisions for which there are material differences in the class of vessels used, kind of freight carried, and in many other respects which it is impracticable to cover in this report. The five geographic divisions for which the statistics are presented may be described as follows:

Atlantic coast and Gulf of Mexico.—The coast line and tributary rivers to what is generally known as the "head of navigation"—to the point navigable for the ordinary freight-carrying steamers and other craft.

Pacific coast (including Alaska).—The coast line and tributary rivers to "head of navigation."

Great Lakes and St. Lawrence River.—Lakes Superior, Michigan, Huron, St. Clair, Erie, and Ontario and the St. Lawrence River.

Mississippi River and its tributaries.—The entire river and the waters of all its tributaries.

All other inland waters.—Canals; lakes other than the Great Lakes; rivers tributary to the Great Lakes; and above the "head of navigation" on all rivers tributary to the Atlantic and Pacific Oceans and the Gulf of Mexico.

The classification of vessels by divisions in 1916 was the same as that followed at the census of 1906, according to the waters on which they were principally operated during the census year. The rule at the census of 1889 was different, the location of operations being fixed as the waters of the home port, that is, the port from which the document was issued. The statistics by divisions, therefore, are fairly comparable only for the two most recent censuses.

TABLE 24.—ALL CLASSES OF VESSELS AND CRAFT, BY DIVISIONS, WITH PER CENT OF INCREASE: 1916, 1906, AND 1889.

DIVISION AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number employed on vessels.	Wages.	Number of passengers carried.
Total:							
1916.....	37,894	12,249,990	\$959,925,364	\$563,736,367	153,301	\$103,235,534	331,590,565
1906.....	37,321	12,893,429	507,973,121	294,854,532	140,929	71,636,521	366,825,663
1889.....	30,485	8,359,135	206,992,352	161,994,066	113,870	41,482,812	198,992,438
Atlantic coast and Gulf of Mexico:							
1916.....	21,658	6,508,617	629,074,203	376,806,060	84,978	58,902,964	237,345,627
1906.....	20,032	4,851,421	273,105,915	159,759,924	77,124	38,352,259	292,555,416
1889 ¹	12,238	2,668,445	116,042,062	90,147,632	2 63,625	2 22,123,099	170,225,458
Pacific coast (including Alaska):							
1916.....	4,092	1,185,961	127,310,646	80,215,193	23,576	18,055,141	55,408,843
1906.....	2,537	977,687	76,622,633	48,520,139	20,142	12,950,399	44,189,971
1889.....	1,635	419,157	21,824,040	19,872,738	11,315	5,880,421	15,672,093
Great Lakes and St. Lawrence River:							
1916.....	2,856	2,737,491	174,765,526	85,095,887	26,873	18,633,219	19,231,681
1906.....	2,990	2,392,863	130,805,640	65,274,702	24,916	13,280,716	14,680,146
1889.....	2,737	920,294	48,580,174	35,463,852	22,726	8,098,191	2,235,993
Mississippi River and its tributaries:							
1916.....	7,239	1,621,495	23,030,503	17,439,746	14,706	6,380,325	17,599,378
1906.....	8,622	4,411,967	22,852,142	17,342,038	16,016	5,692,117	14,122,241
1889.....	7,300	3,364,610	14,407,162	16,331,872	15,951	5,337,185	10,858,894
All other inland waters:							
1916.....	2,049	196,426	5,744,486	4,179,481	3,168	1,263,885	2,005,036
1906.....	2,140	259,491	4,536,791	3,957,729	3,731	1,361,030	1,877,889
1889.....	6,575	996,629	6,138,914	2 177,972	2 253	2 43,916	
PER CENT OF INCREASE.⁴							
Total:							
1906-1916.....	1.5	-5.0	89.0	91.2	8.8	44.1	-9.6
1889-1916.....	24.3	46.5	363.7	248.0	34.6	148.9	66.6
Atlantic coast and Gulf of Mexico:							
1906-1916.....	8.1	34.2	130.3	135.9	10.2	53.6	-18.9
1889-1916.....	77.0	144.8	442.1	318.0	33.6	166.3	39.4
Pacific coast (including Alaska):							
1906-1916.....	61.3	21.3	66.2	65.3	17.0	39.4	25.4
1889-1916.....	150.3	182.9	483.4	303.6	108.4	207.0	253.6
Great Lakes and St. Lawrence River:							
1906-1916.....	-4.5	14.4	33.6	30.4	7.9	40.3	36.6
1889-1916.....	4.3	197.5	259.7	140.0	18.2	130.1	760.1
Mississippi River and its tributaries:							
1906-1916.....	-24.8	-63.2	0.8	0.6	-2.1	12.1	24.6
1889-1916.....	-0.8	-51.8	59.9	6.8	-7.8	19.5	62.1
All other inland waters:							
1906-1916.....	-4.3	-24.3	25.2	5.6	-15.1	-7.1	6.8
1889-1916.....	-68.8	-80.3	-6.4				

¹ Total includes 52 craft with a gross tonnage of 2,553, valued at \$75,360, for which no report was made for income, employees, wages, passengers, and freight carried.

² Does not include employees or wages for yachts.

³ Income, employees, and wages were not reported for canal boats at the census of 1889, and therefore the per cent of increase is not given.

⁴ A minus sign (-) denotes decrease.

In connection with these statistics it should be remembered that the vessels are reported in the divisions in which they are chiefly occupied or employed. Changes of this character, therefore, occur to meet the tonnage demands of commerce which would be impracticable to follow. The great war also has so

changed conditions relating to shipping as to render comparisons in many of its details very unreliable.

Table 24 shows that the Atlantic coast and Gulf of Mexico division led in 1916 in all details shown in this table, reporting nearly three-fifths of the number of vessels, more than one-half of the gross tonnage,

nearly two-thirds of the value of vessels, and over two-thirds of the gross income. Of employees on vessels this division reported more than one-half, with a somewhat larger proportion of salaries and wages, and nearly three-fourths of the number of passengers carried.

The Great Lakes and St. Lawrence River ranked second, except in number of vessels and number of passengers carried, in which respect it was fourth and third, respectively. This division reported nearly one-fourth of the tonnage, but less than one-fifth of the value of vessels, the gross income, number of employees, and the amount of salaries and wages paid.

Although fourth in most details, the Mississippi River and its tributaries ranked second in number of vessels, the majority of which were unrigged, and third in tonnage. "All other inland waters" shows the smallest proportion of the various totals.

In the matter of actual gains from 1906 to 1916, the Atlantic coast and Gulf of Mexico was first in all particulars, except number of passengers carried, for which a decrease of 55,209,789 is shown, due chiefly to the construction of bridges and subaqueous tunnels since 1906 in New York Harbor. In most other details this division led in relative gains, but was second in this respect in number of vessels and in number of employees, the Pacific coast leading in these two particulars. The Atlantic coast is the only division showing an actual percentage loss from 1906 to 1916 in number of passengers carried. The Pacific coast shows an actual gain of 11,218,872 in the number of passengers carried. The Great Lakes and St. Lawrence River, however, reported the greatest proportionate increase in number of passengers carried during this period, 36.6 per cent.

The actual increase for the Atlantic coast and Gulf of Mexico in the value of vessels was \$355,968,288. The greatest relative gain shown for this division, however, 135.9 per cent, was in gross income.

It is notable that while the number and tonnage of vessels operated on the Mississippi River and its tributaries decreased greatly, 2,383, or 24.8 per cent, in number and 2,790,472, or 63.2 per cent, in tonnage, the value of the vessels increased by \$178,361, or eight-tenths of 1 per cent, and the gross income by \$97,708, or six-tenths of 1 per cent. The increase in number of passengers carried by vessels of this division was also large, 3,477,137, or 24.6 per cent.

"All other inland waters," the least important of the five divisions, although showing a decrease in the number and gross tonnage from 1906 to 1916, re-

ported an increase of \$1,157,695, or 25.2 per cent, in the value of vessels; \$221,752, or 5.6 per cent, in gross income; and 127,147, or 6.8 per cent, in number of passengers carried.

CHARACTER OF OWNERSHIP.

The character of ownership of vessels is presented for four classes: (1) individual, (2) firm, (3) incorporated company, and (4) all other, the last class embracing vessels owned by states, municipalities, cooperative associations, etc. The relative importance of these four classes is shown for 1916 and 1906 only, as at the census of 1889 statistics of ownership were secured for but two of the five divisions, the Atlantic coast and Gulf of Mexico, and the Pacific coast.

TABLE 25.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CHARACTER OF OWNERSHIP, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916 AND 1906.

OWNERSHIP AND CENSUS YEAR.	VESSELS.		TONNAGE.		VALUE OF VESSELS.	
	Num-ber.	Per cent of total.	Gross tons.	Per cent of total.	Amount.	Per cent of total.
Total:						
1916.....	37,894	100.0	12,249,990	100.0	\$959,925,364	100.0
1906.....	37,321	100.0	12,893,429	100.0	507,973,121	100.0
Per cent of in-crease ¹	1.5	.....	-5.0	.....	89.0	.....
Individual:						
1916.....	12,995	34.3	1,204,874	9.8	73,237,508	7.6
1906.....	12,944	34.7	1,462,818	11.3	65,833,525	13.0
Per cent of increase ¹	0.4	.....	-17.6	.....	11.2	.....
Firm:						
1916.....	3,488	9.2	552,373	4.5	21,374,278	2.2
1906.....	4,169	11.2	929,311	7.2	28,807,734	5.7
Per cent of increase ¹	-16.3	.....	-40.6	.....	-25.8	.....
Incorporated company:						
1916.....	20,789	54.9	10,383,928	84.8	852,348,622	88.8
1906.....	19,729	52.9	10,375,681	80.5	402,419,557	79.2
Per cent of increase ¹	5.4	.....	0.1	.....	111.8	.....
All other:						
1916.....	622	1.6	108,815	0.9	12,964,956	1.4
1906.....	479	1.3	125,619	1.0	10,912,305	2.1
Per cent of increase ¹	29.9	.....	-13.4	.....	18.8	.....

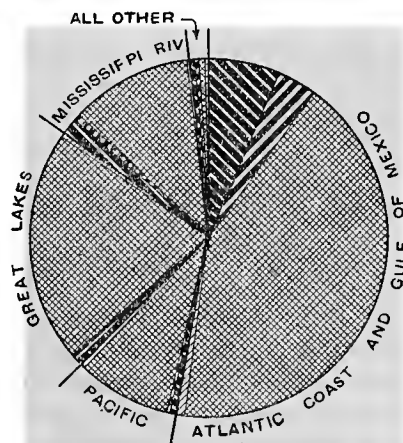
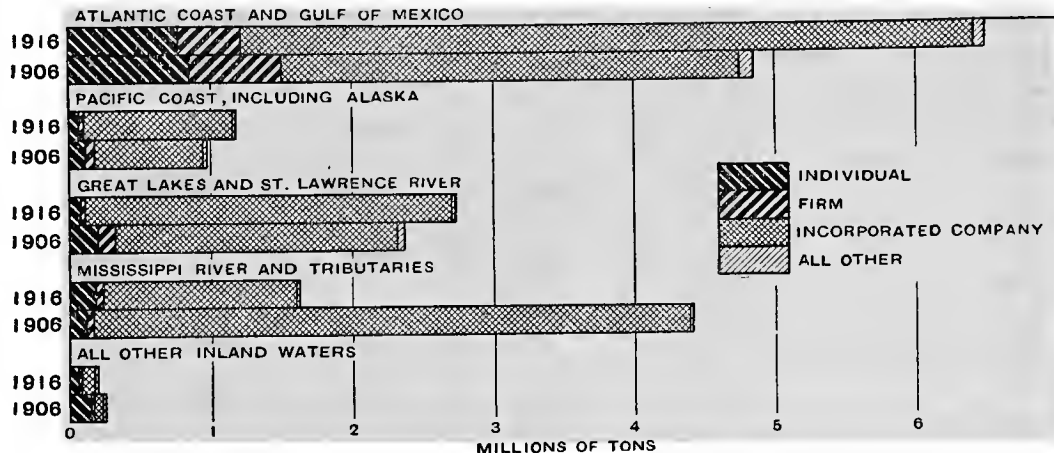
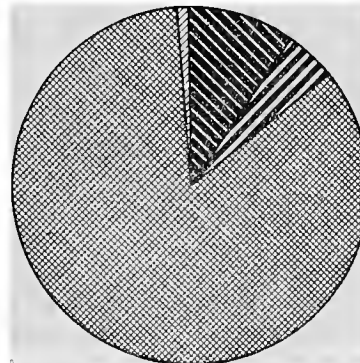
¹ A minus sign (-) denotes decrease.

Incorporated ownership predominated at both censuses, but to a greater degree in 1916 than in 1906. Although this form of ownership controlled but 54.9 per cent of the total number of vessels in 1916, it reported 84.8 per cent of the total gross tonnage of American owned craft and 88.8 per cent of their value. In these three respects vessels under firm ownership in 1916 show decreases compared with 1906, not only in their relative proportions but in the actual totals also. Vessels owned by individuals increased in number and value, but decreased in tonnage between 1906 and 1916.

Table 26 shows the number and gross tonnage of vessels, by character of ownership and by divisions.

TABLE 26.—NUMBER AND GROSS TONNAGE OF VESSELS, BY CHARACTER OF OWNERSHIP AND BY DIVISIONS, WITH PER CENT OF TOTAL: 1916 AND 1906.

DIVISION.	Cen- sus year.	TOTAL.			INDIVIDUAL.			FIRM.			INCORPORATED COM- PANY.			ALL OTHER.		
		Tonnage.			Tonnage.			Tonnage.			Tonnage.			Tonnage.		
		Num- ber of ves- sels.	Gross tons.	Per cent of total.	Num- ber of ves- sels.	Gross tons.	Per cent of total.	Num- ber of ves- sels.	Gross tons.	Per cent of total.	Num- ber of ves- sels.	Gross tons.	Per cent of total.	Num- ber of ves- sels.	Gross tons.	Per cent of total.
Total.....	1916	37,894	12,249,990	100.0	12,995	1,204,874	100.0	3,488	552,373	100.0	20,789	10,383,928	100.0	622	108,815	100.0
	1906	37,321	12,893,429	100.0	12,944	1,462,818	100.0	4,169	929,311	100.0	19,729	10,375,681	100.0	479	125,619	100.0
Atlantic coast and Gulf of Mexico.....	1916	21,658	6,508,617	53.1	8,307	787,787	65.4	2,138	441,266	79.9	10,846	5,200,797	50.1	367	78,767	72.4
	1906	20,032	4,851,421	37.6	8,517	844,064	57.7	2,849	666,005	71.7	8,341	3,246,215	31.3	325	95,137	75.7
Pacific coast (including Alaska).....	1916	4,092	1,185,961	9.7	1,069	72,626	6.0	307	30,601	5.5	2,653	1,065,590	10.3	63	17,144	15.8
	1906	2,537	977,687	7.6	806	119,565	8.2	275	73,131	7.9	1,404	770,404	7.4	52	14,587	11.6
Great Lakes and St. Lawrence River.....	1916	2,856	2,737,491	22.3	847	74,383	6.2	210	22,374	4.1	1,747	2,635,057	25.4	52	5,677	5.2
	1906	2,990	2,392,863	18.6	975	204,175	14.0	429	132,836	14.3	1,536	2,044,131	19.7	50	11,721	9.3
Mississippi River and its tributaries.....	1916	7,239	1,621,495	13.2	1,852	182,084	15.1	616	46,418	8.4	4,731	1,390,915	13.4	40	2,078	1.9
	1906	9,622	4,411,967	34.2	1,318	134,655	9.2	533	49,346	5.3	7,752	4,226,600	40.7	19	1,366	1.1
All other inland waters.....	1916	2,049	196,426	1.6	920	87,994	7.3	217	11,714	2.1	812	91,569	0.9	100	5,149	4.7
	1906	2,140	259,491	2.0	1,328	160,359	11.0	83	7,993	0.9	696	88,331	0.9	33	2,808	2.2

DIAGRAM 3.—GROSS TONNAGE OF VESSELS, BY CHARACTER OF OWNERSHIP AND BY DIVISIONS: 1916 AND 1906.GROSS
TONNAGE
1916

In 1916 the Atlantic coast division reported more than one-half of the total tonnage for all divisions combined, increasing its proportion from 37.6 per cent in 1906 to 53.1 per cent in 1916. The Mississippi River division shows the most marked change, a decrease in its proportion of the total tonnage from 34.2 per cent in 1906 to 13.2 per cent in 1916. This change is confined to vessels of corporate ownership which shows a decrease in the tonnage from 40.7 per cent of the total in 1906 to 13.4 per cent in 1916.

In considering ownership by character of propulsion, it is found that one-half of the steam vessels and nearly three-fifths of the sailing vessels were owned by individuals in 1916, a gain in the proportion of steam vessels individually owned over their proportion in 1906 and a slight loss in this respect for the individually owned sailing vessels, which comprised a little more than two-thirds of all the sailing vessels at that census. Less than one-fifth of the unrigged craft was owned by individuals at both censuses.

TABLE 27.—NUMBER AND GROSS TONNAGE OF STEAM, SAIL, AND UNRIGGED VESSELS, BY CHARACTER OF OWNERSHIP AND BY OCCUPATION, WITH PER CENT OF INCREASE: 1916 AND 1906.

CLASS AND OCCUPATION.	Census year.	TOTAL.		INDIVIDUAL.		FIRM.		INCORPORATED COMPANY.		ALL OTHER.	
		Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.
Total.....	1916	37,894	12,249,990	12,995	1,204,874	3,488	552,373	20,789	10,383,928	622	108,815
Per cent of increase ¹	1906	37,321	12,893,429	12,944	1,462,818	4,169	929,311	19,729	10,375,681	479	125,619
		1.5	-5.0	0.4	-17.6	-16.3	-40.6	5.4	0.1	29.9	-13.4
Steam ²	1916	14,581	6,097,562	7,290	255,530	1,251	64,871	5,736	5,727,390	304	49,771
Per cent of increase ¹	1906	9,927	4,059,521	4,359	316,219	1,141	145,326	4,224	3,555,040	203	42,936
		46.9	50.2	67.2	-19.2	9.6	-55.4	35.8	61.1	49.8	15.9
Freight and passenger.....	1916	5,362	5,432,353	1,992	97,241	470	38,394	2,885	5,293,802	15	2,916
Per cent of increase ¹	1906	3,615	3,411,588	1,101	189,707	437	113,611	2,055	3,104,291	22	3,979
		48.3	59.2	80.9	-48.7	7.6	-66.2	40.4	70.5	22	-26.7
Tugs and other towing vessels.....	1916	3,689	264,135	1,068	36,818	381	16,484	2,191	207,652	49	3,181
Per cent of increase ¹	1906	3,079	261,375	902	37,079	488	25,288	1,644	192,313	45	6,697
		19.8	1.1	18.4	-0.7	-21.9	-34.8	33.3	8.0	45	-52.5
Ferryboats.....	1916	611	224,328	172	6,265	55	1,674	334	190,986	50	25,403
Per cent of increase ¹	1906	536	261,073	115	5,423	39	1,752	352	233,630	30	20,268
		14.0	-14.1	49.6	15.5	.....	-4.5	-5.1	-18.3	.....	25.3
Yachts.....	1916	3,785	111,620	3,427	103,223	234	3,659	104	4,441	20	297
Per cent of increase.....	1906	2,176	82,275	1,978	78,188	130	2,415	55	1,500	13	172
		73.9	35.7	73.3	32.0	80.0	51.5	.....	196.1	.....	72.7
Miscellaneous.....	1916	1,134	65,126	631	11,983	111	4,660	222	30,509	170	17,974
Per cent of increase.....	1906	521	43,210	263	5,822	47	2,262	118	23,306	93	11,820
		117.7	50.7	139.9	105.8	.....	106.0	88.1	30.9	.....	52.1
Sail.....	1916	3,002	1,171,174	1,700	226,700	430	143,429	814	779,600	58	21,445
Per cent of increase ¹	1906	7,131	1,704,277	4,772	483,859	1,403	435,756	857	729,784	99	54,878
		-57.9	-31.3	-64.4	-53.1	-69.4	-67.1	-5.0	6.8	.....	-60.9
Freight and passenger.....	1916	2,357	1,156,354	1,120	214,930	391	142,926	796	777,534	50	20,964
Per cent of increase ¹	1906	5,181	1,672,862	3,028	457,877	1,252	433,412	840	728,718	61	52,859
		-54.5	-30.9	-63.0	-53.1	-68.8	-67.0	-5.2	6.7	.....	-60.3
Yachts.....	1916	569	11,387	528	10,745	35	402	5	218	1	22
Per cent of increase ¹	1906	1,594	24,155	1,461	22,540	116	1,310	9	161	8	144
		-64.3	-52.9	-63.9	-52.3	-69.8	-69.3	.....	35.4	.....	-84.7
Miscellaneous.....	1916	76	3,433	52	1,025	4	101	13	1,848	7	459
Per cent of increase ¹	1906	356	7,260	283	3,442	35	1,034	8	909	30	1,875
		-78.7	-52.7	-81.6	-70.2	.....	-90.2	.....	103.3	.....	-75.5
Unrigged.....	1916	20,311	4,981,254	4,005	722,644	1,807	344,073	14,239	3,876,938	260	37,599
Per cent of increase ¹	1906	20,263	7,129,631	3,813	662,740	1,625	348,229	14,648	6,090,857	177	27,805
		0.2	-30.1	5.0	9.0	11.2	-1.2	-2.8	-36.3	46.9	35.2

¹ A minus sign (-) denotes decrease. Percentages are omitted when base is less than 100.

² Includes craft propelled by machinery.

In explanation of the large proportion of the total number of steam vessels under individual ownership, consideration should be given to the fact that of the 14,581 steam vessels 8,537, or more than one-half, were motor-propelled craft. No doubt most of the motor boats were owned by individuals. The tonnage of motor boats as a class averaged 23 in 1916 and 16 in 1906, as compared with an average tonnage for the strictly steam vessels of 976 and 593, respectively.

In 1916, although corporations owned only about two-fifths of the total number of those classed as steam vessels, they represented over nine-tenths of the total tonnage. The proportion of the total number of sailing vessels reported by corporations was over one-fourth in 1916, as against one-eighth in 1906, while their tonnage represented practically two-thirds in 1916, as compared with a little over two-fifths in 1906.

Corporations owned a large majority of the unrigged craft in 1916, about seven-tenths of the total

number, and a slightly larger proportion in 1906. To the overwhelming corporation control of number of unrigged craft in 1916, as well as in 1906, a like control of the tonnage is added—nearly four-fifths in 1916 and somewhat more than four-fifths in 1906. Of the steam freight and passenger vessels corporations owned more than one-half of the total number and over nine-tenths of the total tonnage at both censuses, and although the proportion of the vessels so owned was slightly less in 1916 than in 1906 the proportion of tonnage was greater, indicating vessels of larger average tonnage at the later census.

Individual ownership prevailed in the number of sailing vessels carrying freight and passengers in 1916, although the proportion of craft so owned decreased from more than one-half in 1906 to less than one-half in 1916. In the tonnage of such vessels, however, corporation ownership led, controlling more than two-thirds of the total in 1916, as compared with a little more than two-fifths in 1906.

Concerning tugs, corporations reported slightly less than three-fifths of their total number in 1916, a small increase, however, since 1906, but the tonnage so owned increased from about three-fourths of the total in 1906 to nearly four-fifths in 1916. The ferryboat ownership shows that corporations, although owning

more than one-half of the total number reported for the United States in 1916, controlled an even greater proportion in 1906, when almost two-thirds were under such ownership. The great bulk of the ferryboat tonnage in both 1916 and 1906—over four-fifths in both years—was owned by corporations, although the proportion in 1916 was slightly less than that in 1906. Individual ownership was greatly predominant in the number and tonnage of yachts, both steam and sail—over nine-tenths at both censuses. In the miscellaneous group individual ownership was also predominant in number of steam vessels, but in tonnage it gave place to corporations. In sailing vessels the miscellaneous class was comparatively insignificant and shows increases only for vessels under corporate ownership.

CONSTRUCTION.

The number and gross tonnage of documented vessels built in American shipyards each year from 1889 to June 30, 1916, are shown in Table 28, grouped according to the character of the materials used in their construction. As will be seen, the banner year for construction of vessels of metal, both number and tonnage, was in 1908, while for construction of wooden vessels, 1901 shows the largest number of vessels built, but 1891 the greatest amount of tonnage.

TABLE 28.—CLASS, NUMBER, AND GROSS TONNAGE OF METAL AND WOODEN VESSELS BUILT IN THE UNITED STATES AND DOCUMENTED: 1889-1916.¹

YEAR ENDED JUNE 30—	AGGREGATE.				STEAM. ²								SAIL.								UNRIGGED.							
	Metal.		Wood.		Total.		Metal.		Wood.				Total.		Metal.		Wood.				Total.		Metal.		Wood.			
	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.	Num- ber.	Tons.
1889.....	54	62,356	1,023	168,778	440	159,318	52	62,261	338	97,057	489	50,570	2	95	487	50,475	148	21,246	.....	.....	148	21,246	.....	.....	148	21,246	.....	.....
1890.....	58	84,659	983	209,463	440	159,045	61	79,342	349	79,703	505	102,873	2	184	503	102,689	136	32,204	5	5,133	131	27,071	.....	.....	131	27,071	.....	.....
1891.....	91	109,146	1,293	260,156	488	185,037	81	102,630	407	82,407	733	144,290	4	211	729	144,079	163	39,975	6	6,305	157	33,670	.....	.....	157	33,670	.....	.....
1892.....	61	51,269	1,334	148,364	438	92,531	52	45,896	386	46,635	846	83,217	5	415	841	82,802	111	23,885	4	4,958	107	18,927	.....	.....	107	18,927	.....	.....
1893.....	78	96,662	878	114,917	380	134,308	61	82,933	319	51,375	493	49,348	8	2,012	485	47,336	83	27,923	9	11,717	74	16,206	.....	.....	74	16,206	.....	.....
1894.....	40	51,536	798	79,659	293	83,720	38	46,889	255	36,831	477	37,827	2	4,647	475	33,180	68	9,648	.....	.....	68	9,648	.....	.....	68	9,648	.....	.....
1895.....	45	49,306	649	62,296	248	69,754	37	43,335	211	26,419	397	34,900	3	5,267	394	29,633	49	6,948	5	704	44	6,244	.....	.....	44	6,244	.....	.....
1896.....	60	101,598	663	125,498	286	138,028	47	82,311	239	55,717	369	65,236	6	15,800	363	49,436	68	23,832	7	3,487	61	20,345	.....	.....	61	20,345	.....	.....
1897.....	71	126,085	820	106,147	288	106,153	48	83,140	240	23,013	338	64,308	10	31,424	328	32,884	265	61,771	13	11,521	252	50,250	.....	.....	252	50,250	.....	.....
1898.....	64	62,325	888	118,133	394	105,838	52	48,560	342	57,278	359	34,416	2	6,724	357	27,692	199	40,204	10	7,041	189	33,163	.....	.....	189	33,163	.....	.....
1899.....	92	131,756	1,181	168,282	439	151,058	83	112,781	356	38,277	420	98,073	5	16,152	415	81,921	414	50,907	4	2,823	410	48,084	.....	.....	410	48,084	.....	.....
1900.....	92	197,125	1,355	196,621	422	202,528	81	167,957	341	34,571	504	116,416	11	29,168	493	87,248	521	74,802	.....	.....	521	74,802	.....	.....	521	74,802	.....	.....
1901.....	121	262,730	1,459	220,759	506	273,591	102	236,159	404	37,432	526	126,165	12	21,746	514	104,419	548	83,733	7	4,825	541	78,908	.....	.....	541	78,908	.....	.....
1902.....	107	280,362	1,384	188,469	579	308,178	102	270,932	477	37,246	581	97,698	3	8,406	578	89,292	331	62,955	2	1,024	329	61,931	.....	.....	329	61,931	.....	.....
1903.....	108	258,219	1,203	177,933	651	271,781	100	240,107	451	31,674	470	89,979	4	12,184	466	77,795	290	74,392	4	5,928	286	68,464	.....	.....	286	68,464	.....	.....
1904.....	98	241,080	1,086	137,462	613	255,744	88	222,307	525	33,437	330	64,908	4	15,290	326	49,618	241	57,890	6	3,483	235	54,407	.....	.....	235	54,407	.....	.....
1905.....	89	132,740	1,013	147,576	560	197,702	68	170,404	492	27,298	310	79,418	5	3,225	305	76,193	232	53,196	16	9,111	216	44,085	.....	.....	216	44,085	.....	.....
1906.....	115	297,270	1,106	121,475	650	315,707	100	288,994	550	26,713	229	35,209	4	3,077	225	32,132	342	67,829	11	5,199	331	62,630	.....	.....	331	62,630	.....	.....
1907.....	129	348,555	1,028	122,777	674	365,405	108	333,516	566	31,839	147	24,907	4	5,655	143	19,252	336	81,020	17	9,384	319	71,636	.....	.....	319	71,636	.....	.....
1908.....	149	450,017	1,308	164,199	928	481,624	132	442,625	791	38,999	134	31,981	.....	.....	134	31,981	400	100,611	17	7,392	383	93,219	.....	.....	383	93,219	.....	.....
1909.....	89	136,923	1,158	101,167	821	148,208	67	123,142	754	25,066	141	28,950	9	7,985	132	20,965	285	60,932	13	5,796	272	55,136	.....	.....	272	55,136	.....	.....
1910.....	119	250,624	1,242	91,444	936	257,993	94	234,988	842	23,005	127	19,358	6	3,699	121	15,659	298	64,717	19	11,937	279	52,780	.....	.....	279	52,780	.....	.....
1911.....	126	201,973	1,296	89,189	969	227,231	112	195,964	857	31,267	82	10,092	1	1,290	81	8,802	371	53,539	13	4,719	358	49,120	.....	.....	358	49,120	.....	.....
1912.....	104	135,881	1,401	96,788	1,051	153,493	81	119,181	970	34,312	95	21,221	5	6,097	90	15,124	359	57,955	18	10,603	341	47,352	.....	.....	341	47,352	.....	.....
1913.....	132	231,662	1,343	114,493	1,004	243,408	104	205,675	900	37,733	72	28,610	6	13,000	66	15,610	399	74,137	22	12,987	377	61,150	.....	.....	377	61,150	.....	.....
1914.....	122	205,431	1,029	110,819	778	224,225	101	195,611	677	28,614	51	13,749	.....	.....	51	13,749	322	78,276	21	9,820	301	68,456	.....	.....	301	68,456	.....	.....
1915.....	71	130,882	1,086	94,240	751	154,990	63	129,024	688	25,966	51	8,021	.....	.....	51	8,021	355	62,111	8	1,858	347	60,253	.....	.....	347	60,253	.....	.....
1916.....	95	238,772	842	86,641	624	250,125	78	234,997	546	15,128	34	14,765	.....	.....	34	14,765	279	60,523	17	3,775	262	56,748	.....	.....	262	56,748	.....	.....

¹ From the reports of the Commissioner of Navigation, Department of Commerce.

² Includes craft propelled by machinery.

The figures in Table 28 include the output of Hawaii and Porto Rico, which combined in 1916 represented only a total of 6 vessels with a tonnage of 87, as shown in the report of the Commissioner of Navigation for 1916.

In 1906 the total number of metal vessels built in the United States and documented was 115 and their tonnage was 297,270; in 1916 the number was only 95 with a tonnage of 238,772, decreases that were distributed among all classes of vessels, except the number of unrigged vessels, which increased. The most notable loss in vessels constructed of metal was in sailing vessels, none having been built since 1913, when 6 with a gross tonnage of 13,000 were reported. The number and

tonnage of wooden vessels built and documented also shows a decrease; there were 1,106 with a tonnage of 121,475 built in 1906, but only 842 with a tonnage of 86,641 in 1916. The decrease in tonnage is pronounced both in steam and sail, but less marked in unrigged craft.

The value of the vessels as shown in this report does not represent the initial cost of construction, but the commercial or other value placed upon the craft by the owners, and while the statistics indicate the relative importance of metal, wooden, and composite vessels, based upon this valuation, such figures should be carefully considered with those showing the increases or decreases in their number and tonnage.

TABLE 29.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS IN EACH DIVISION, BY CHARACTER OF CONSTRUCTION, WITH PER CENT OF INCREASE: 1916, 1906, AND 1889.

DIVISION AND CENSUS YEAR.	TOTAL.			METAL.			WOOD.			COMPOSITE.		
	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.
Total:												
1916	37,894	12,249,990	\$959,925,364	3,298	5,814,903	\$725,373,070	34,477	6,376,401	\$227,930,398	119	58,686	\$6,621,896
1906	37,321	12,893,429	507,873,121	1,979	3,276,723	306,229,289	35,247	9,581,348	199,135,582	95	35,358	2,608,250
1889	30,485	8,359,135	206,992,352	548	525,218	60,918,319	29,834	7,793,259	153,552,913	103	40,658	2,521,120
Atlantic coast and Gulf of Mexico: ¹												
1916	21,658	6,508,617	629,074,203	1,769	2,776,363	476,382,954	19,850	3,720,454	150,657,529	39	11,800	2,033,720
1906	20,032	4,851,421	273,105,915	1,148	1,247,838	155,776,134	18,827	3,591,278	115,877,581	57	12,305	1,452,200
1889	12,238	2,658,445	116,042,062	434	364,283	33,622,030	11,714	2,269,558	81,236,912	90	24,604	1,183,120
Pacific coast (including Alaska): ¹												
1916	4,092	1,185,961	127,310,646	242	560,486	85,982,587	3,846	624,064	41,142,417	4	1,411	185,642
1906	2,537	977,687	76,622,633	130	354,134	41,375,742	2,404	622,606	35,168,891	3	947	78,000
1889	1,635	419,157	21,824,040	23	48,121	6,613,065	1,610	369,738	15,100,975	2	1,298	110,000
Great Lakes and St. Lawrence River:												
1916	2,856	2,737,491	174,765,526	832	2,353,777	155,231,482	1,993	341,603	15,550,105	31	42,111	3,983,939
1906	2,990	2,392,863	130,805,640	572	1,634,153	105,729,416	2,391	737,386	24,075,474	27	21,324	1,000,750
1889	2,737	920,294	48,580,174	85	111,410	10,674,224	2,641	794,128	36,777,950	11	14,756	1,228,000
Mississippi River and its tributaries: ²												
1916	7,239	1,621,495	23,030,503	411	116,112	6,392,750	6,796	1,502,966	16,370,993	32	2,417	266,760
1906	9,622	4,411,967	22,852,142	107	33,893	2,580,682	9,513	4,377,480	20,213,460	2	594	58,000
1889	7,300	3,364,610	14,407,162				7,300	3,364,610	14,407,162			
All other inland waters: ³												
1916	2,049	196,426	5,744,486	44	8,165	1,383,297	1,992	187,314	4,209,354	13	947	151,835
1906	2,140	259,491	4,586,791	22	6,705	767,315	2,112	252,598	3,800,176	6	188	19,300
1889	6,575	996,629	6,138,914	6	1,404	108,000	6,569	995,225	6,029,914			
PER CENT OF INCREASE: ⁴												
Total:												
1906-1916	1.5	-5.0	89.0	66.6	77.5	136.9	-2.2	-33.4	14.5	66.0	153.9	
1889-1916	24.3	46.5	363.7				15.6	-18.2	48.4	44.3	162.7	
Atlantic coast and Gulf of Mexico:												
1906-1916	8.1	34.2	130.3	54.1	122.5	205.8	5.4	3.6	30.0	-4.1	40.0	
1889-1916	77.0	144.8	442.1				69.5	63.9	85.5	-52.0	71.9	
Pacific coast (including Alaska):												
1906-1916	61.3	21.3	66.2	86.2	58.3	107.8	60.0	0.2	17.0	49.0	138.0	
1889-1916	150.3	182.9	483.4				138.9	68.8	172.4	8.7	68.8	
Great Lakes and St. Lawrence River:												
1906-1916	-4.5	14.4	33.6	45.5	44.0	46.8	-16.6	-53.7	-35.4	97.5	298.1	
1889-1916	4.3	197.5	259.7				-24.5	-57.0	-57.7	185.4	224.4	
Mississippi River and its tributaries:												
1906-1916	-24.8	-63.2	0.8	284.1	242.6	147.7	-28.6	-65.7	-19.0	306.9	559.9	
1889-1916	-0.8	-51.8	59.9				-6.9	-55.3	13.6			
All other inland waters:												
1906-1916	-4.3	-24.3	25.2		21.8	80.3	-5.7	-25.8	10.8	403.7	686.7	
1889-1916	-68.8	-80.3	-6.4				-69.7	-81.2	-30.2			

¹ The character of construction of unrigged craft was not reported in 1889, but for purposes of comparison in this table all were assumed to be of wood.

² The character of construction was not reported in 1889, but for purposes of comparison in this table all vessels were assumed to be of wood.

³ The character of construction was not reported for 14 vessels operating on the Red River (of the North) and 6,614 canal boats in 1889, but for purposes of comparison in this table all of these were assumed to be of wood.

⁴ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100, or when figures are known not to be comparable.

At the census of 1889 the character of construction of vessels was not reliably reported. A careful comparison of growth, therefore, is best limited to the figures shown for the censuses of 1916 and 1906.

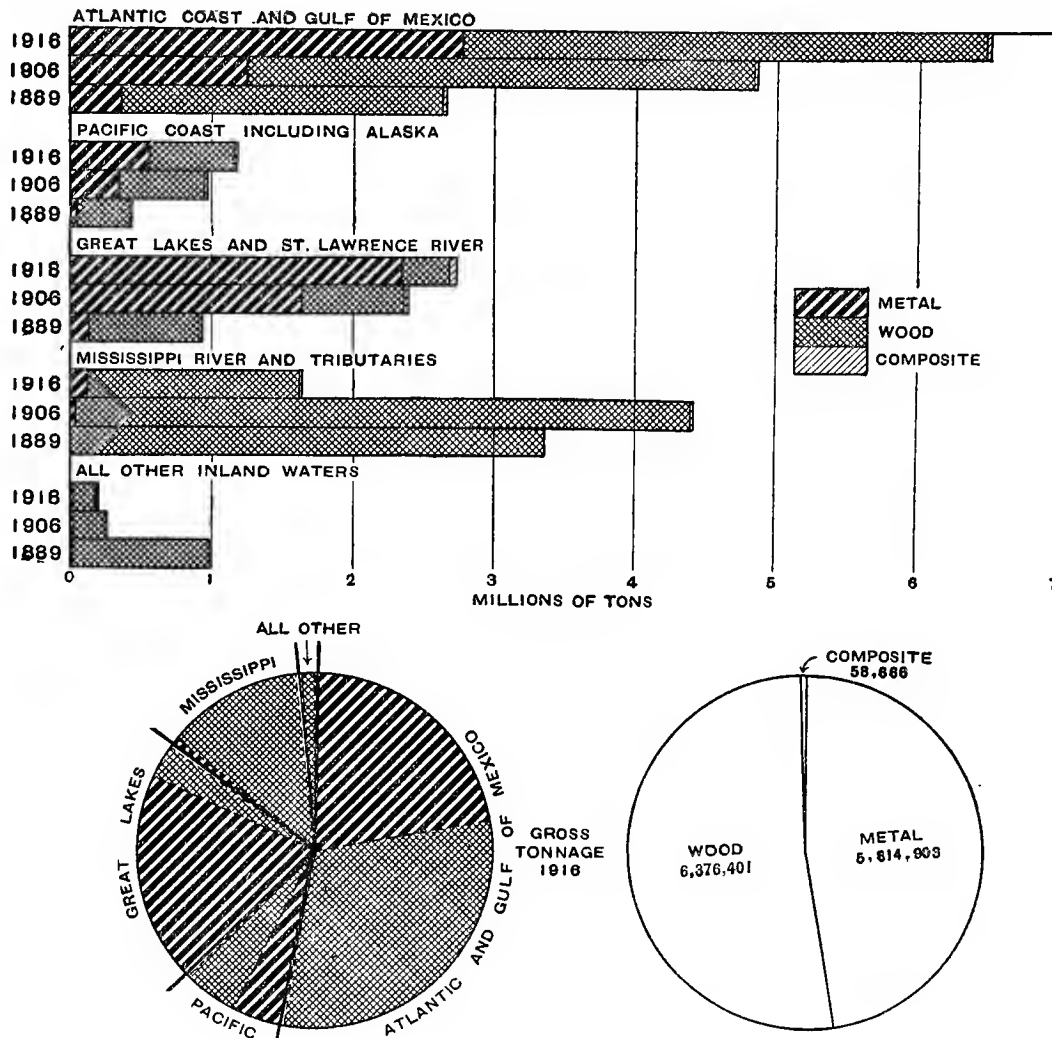
Although in 1916, as in 1906 and 1889, the largest proportion of the tonnage of vessels in the United

States was of wooden construction, the gross tonnage of vessels of metal and also of composite construction shows substantial increases during the ten-year period 1906-1916, while that of wooden vessels shows a large decrease, amounting to 3,204,947 tons, or 33.4 per cent. Of this reduction in the tonnage of wooden vessels,

2,874,514 tons, or nearly nine-tenths, was confined to the Mississippi River and its tributaries and represented the decrease in the unrigged tonnage for that division. Wooden vessels operated on the Atlantic and Pacific coasts showed a slight increase in this respect. The gross tonnage of vessels constructed of metal has shown a steady increase since 1889 for the United States as a

whole and for the several divisions. From 1906 this increase for the United States amounted to 2,538,180 tons, or 77.5 per cent. The largest actual increase shown for any division occurred in the Atlantic coast and Gulf of Mexico, metal vessels operating in the waters of this division increasing 1,528,525 tons, or 122.5 per cent.

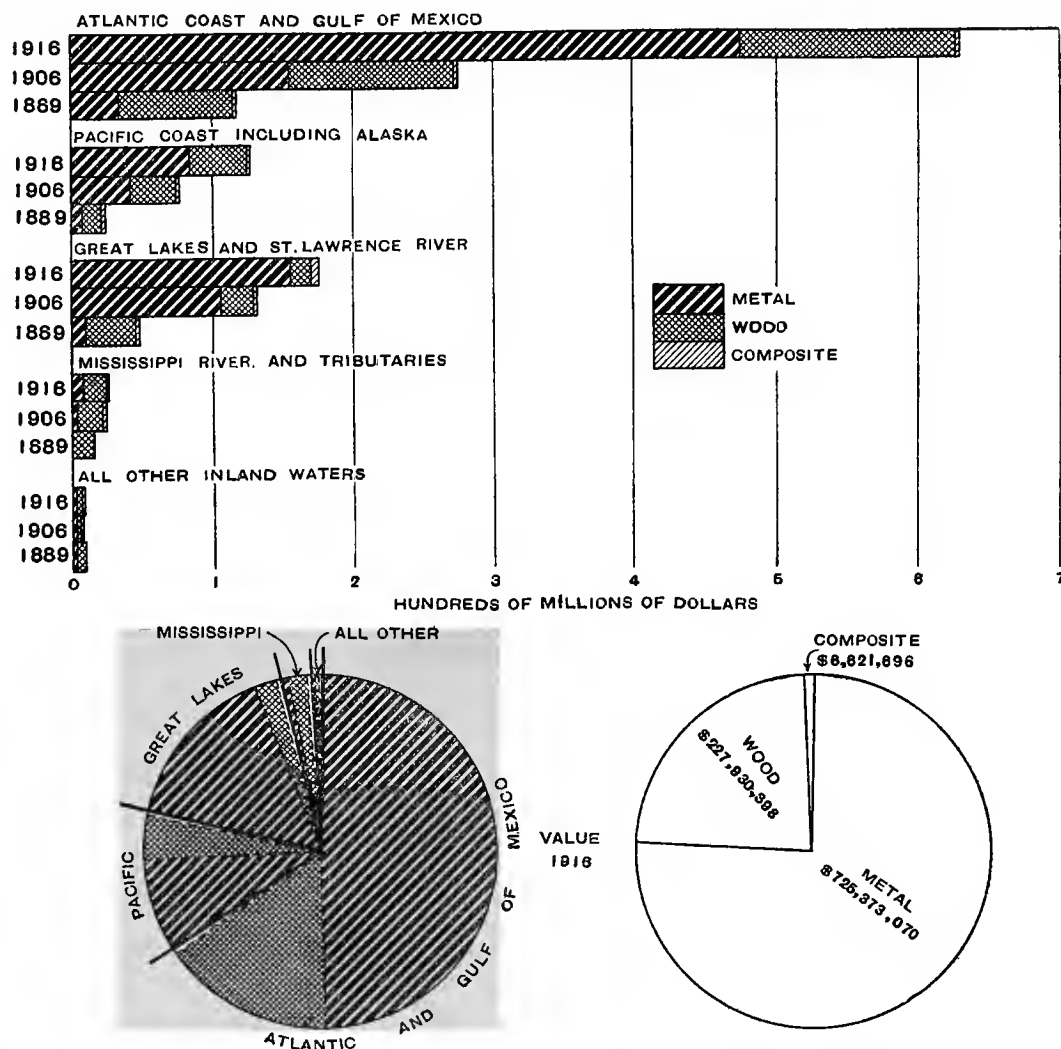
DIAGRAM 4.—GROSS TONNAGE OF VESSELS, BY DIVISIONS AND CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.



The statistics for vessels of composite construction show that for the United States as a whole the gain in tonnage for the 27 years covered by the table was 18,028 tons, or 44.3 per cent. There was a slight decline during the period 1889–1906, followed by a gain from 1906 to 1916 of 23,328 tons, or 66 per cent. None of the composite increase was reported for the Atlantic coast division, which showed a loss of 12,804 tons, or 52 per cent, during the 27 years, and 505 tons, or 4.1 per cent, from 1906 to 1916. At the census of 1889 the character of construction was not reported for the Mississippi River and its tributaries and only partly

for "All other inland waters," but the gain in vessels of composite construction in the former division from 1906 to 1916 was 1,823 tons, or 306.9 per cent, and in the latter it was 759 tons, or 403.7 per cent. The Great Lakes and St. Lawrence River division held first place in tonnage of composite construction in both 1906 and 1916, reporting 60.3 per cent of the total in 1906 and 71.8 per cent in 1916. This division showed a gain in this class of tonnage of 27,355 tons, or 185.4 per cent, during the 27 years covered by the table, and 20,787 tons, or 97.5 per cent, during the 10-year period 1906–1916.

DIAGRAM 5.—VALUE OF VESSELS, BY DIVISIONS AND CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.



The increase or decrease in the relative importance of metal, wooden, and composite tonnage in the different divisions is shown in Table 30.

Of the total tonnage of vessels of all classes of construction, great changes are noticeable for the several divisions from census to census. In 1889 the greatest proportion, 40.3 per cent, is shown for the Mississippi River, this proportion decreasing to 34.2 per cent in 1906, and 13.2 per cent in 1916. On the other hand, the Atlantic coast increased its proportion from 31.8 per cent in 1889 to 37.6 in 1906 and 53.1 in 1916. The proportions for the Pacific coast increased slightly at each census, while the Great Lakes division, which had 11 per cent in 1889, doubled this proportion in 1916. "All other inland waters," although reporting 11.9 per cent in 1889, had but 1.6 per cent in 1916. The proportions for the several classes of construction show some remarkable changes. In 1889 the Atlantic coast was first in metal and composite tonnage, but in the latter class decreased from 60.5 per cent in 1889 to 20.1 per cent in 1916, although still first in metal at that census. The Great Lakes shows decided prominence in metal and in composite construction, reporting 71.8 per cent of the latter class in 1916.

TABLE 30.—PER CENT OF TOTAL GROSS TONNAGE OF METAL, WOOD, AND COMPOSITE VESSELS, BY DIVISIONS: 1916, 1906, AND 1889.

DIVISION AND CENSUS YEAR.	PER CENT OF TOTAL.			
	Total.	Metal.	Wood.	Com- posite.
Total:				
1916.....	100.0	100.0	100.0	100.0
1906.....	100.0	100.0	100.0	100.0
1889.....	100.0	100.0	100.0	100.0
Atlantic coast and Gulf of Mexico:				
1916.....	53.1	47.7	58.3	20.1
1906.....	37.6	38.1	37.5	34.8
1889.....	31.8	69.4	29.1	60.5
Pacific coast (including Alaska):				
1916.....	9.7	9.6	9.8	2.4
1906.....	7.6	10.8	6.5	2.7
1889.....	5.0	9.2	4.7	3.2
Great Lakes and St. Lawrence River:				
1916.....	22.3	40.5	5.4	71.8
1906.....	18.6	49.9	7.7	60.3
1889.....	11.0	21.2	10.2	36.3
Mississippi River and its tributaries:				
1916.....	13.2	2.0	23.6	4.1
1906.....	34.2	1.0	45.7	1.7
1889.....	40.3	.....	43.2	.....
All other inland waters:				
1916.....	1.6	0.1	2.9	1.6
1906.....	2.0	0.2	2.6	0.5
1889.....	11.9	0.3	12.8	.....
United States:				
1916.....	100.0	47.5	52.0	0.5
1906.....	100.0	25.4	74.3	0.3
1889.....	100.0	6.3	93.2	0.5

The Mississippi River led in the proportion of wooden tonnage in 1889 and 1906 but decreased greatly in 1916, when its proportion was 23.6 per cent. Metal and composite construction was chiefly confined to

the Great Lakes and the Atlantic coast, these two divisions combined reporting about nine-tenths of the metal and a larger proportion of the composite tonnage at each census.

TABLE 31.—VESSELS OF EACH OCCUPATION IN EACH DIVISION, GROUPED BY CHARACTER OF CONSTRUCTION: 1916.

CLASS, OCCUPATION, AND DIVISION.	TOTAL.			METAL.			WOOD.			COMPOSITE.		
	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.
STEAM.¹												
Freight and passenger.....	5,362	5,432,353	\$677,475,337	1,440	4,869,180	\$620,481,652	3,877	513,195	\$851,569,885	45	49,978	\$55,423,800
Atlantic coast and Gulf of Mexico.....	2,798	2,403,734	430,299,612	727	2,221,782	405,238,057	2,059	172,448	23,589,106	12	9,504	1,472,449
Pacific coast (including Alaska).....	1,005	611,021	89,404,958	146	445,029	70,721,999	857	165,467	18,605,254	2	625	77,705
Great Lakes and St. Lawrence River.....	910	2,350,050	151,015,091	517	2,185,489	141,895,732	373	125,526	5,393,713	20	39,035	3,730,646
Mississippi River and its tributaries.....	389	48,602	4,531,749	30	10,018	1,543,526	358	38,362	2,963,223	1	222	25,000
Canals and other inland waters of New York state.....	70	8,586	814,881	6	3,542	466,699	62	4,658	297,682	2	356	50,000
All other inland waters.....	190	10,360	1,406,546	14	3,320	617,639	168	6,734	720,907	8	306	65,000
Tugs and other towing vessels.....	3,689	264,135	54,909,495	581	96,930	26,098,625	3,096	165,856	28,575,588	12	1,349	235,282
Atlantic coast and Gulf of Mexico.....	1,856	153,122	37,841,756	388	72,275	20,109,246	1,467	80,737	17,721,539	1	110	10,971
Pacific coast (including Alaska).....	642	35,600	6,866,934	21	4,565	2,087,664	621	31,035	4,778,720	.....	.....	.....
Great Lakes and St. Lawrence River.....	301	19,500	3,602,554	99	10,214	2,161,825	200	9,267	1,422,753	2	109	17,976
Mississippi River and its tributaries.....	736	48,865	6,917,111	60	9,126	1,596,356	668	39,843	4,158,755	8	902	182,000
Canals and other inland waters of New York state.....	59	2,085	274,265	10	701	151,000	49	1,384	143,265	.....	.....	.....
All other inland waters.....	95	3,873	407,425	3	55	12,634	91	3,500	370,536	1	228	24,335
Fishing vessels.....	3,478	96,681	15,910,757	69	8,665	1,881,828	3,407	87,991	14,022,129	2	25	6,800
Atlantic coast and Gulf of Mexico.....	2,011	61,056	9,647,473	19	3,819	886,800	1,992	57,237	8,760,673	.....	.....	.....
Pacific coast (including Alaska).....	850	25,301	5,054,418	15	3,447	749,000	835	21,854	4,305,418	.....	.....	.....
Great Lakes and St. Lawrence River.....	606	10,196	1,190,866	35	1,399	246,028	569	8,772	938,038	2	25	6,800
Mississippi River and its tributaries.....	8	92	14,400	.....	.....	.....	8	92	14,400	.....	.....	.....
Canals and other inland waters of New York state.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other inland waters.....	3	36	3,600	.....	.....	.....	3	36	3,600	.....	.....	.....
Ferryboats.....	611	224,328	23,227,174	166	140,151	15,641,062	441	83,305	7,481,675	4	872	104,437
Atlantic coast and Gulf of Mexico.....	262	153,818	14,664,883	127	117,188	12,251,138	135	36,630	2,413,725	.....	.....	.....
Pacific coast (including Alaska).....	76	51,480	6,607,936	9	14,036	2,341,001	66	36,644	4,168,998	1	800	97,937
Great Lakes and St. Lawrence River.....	43	7,254	874,675	11	3,881	630,373	32	3,383	244,302	.....	.....	.....
Mississippi River and its tributaries.....	213	11,263	1,014,950	18	4,875	393,550	192	6,316	614,900	3	72	6,500
Canals and other inland waters of New York state.....	3	66	12,500	.....	.....	.....	3	66	12,500	.....	.....	.....
All other inland waters.....	14	437	52,250	1	171	25,000	13	266	27,250	.....	.....	.....
Yachts.....	3,785	111,620	33,447,143	179	44,528	16,610,324	3,587	65,514	16,345,319	19	1,578	491,500
Atlantic coast and Gulf of Mexico.....	2,587	81,766	25,590,224	121	34,469	12,971,874	2,452	45,856	12,160,850	14	1,441	457,500
Pacific coast (including Alaska).....	293	8,417	2,139,937	7	3,685	1,184,000	286	4,732	955,937	.....	.....	.....
Great Lakes and St. Lawrence River.....	459	13,124	4,167,560	29	4,859	2,079,030	428	8,162	2,065,560	2	103	23,000
Mississippi River and its tributaries.....	325	6,429	1,206,153	20	1,480	356,450	304	4,942	848,203	1	7	1,500
Canals and other inland waters of New York state.....	32	671	159,450	1	20	3,000	29	624	146,950	2	27	9,500
All other inland waters.....	89	1,213	183,819	1	15	16,000	88	1,198	167,819	.....	.....	.....
Miscellaneous.....	1,134	65,126	13,095,960	96	23,923	6,939,946	1,033	40,427	6,045,897	5	776	110,117
Atlantic coast and Gulf of Mexico.....	844	36,513	9,013,862	54	16,310	4,978,702	788	20,095	4,018,360	2	108	16,800
Pacific coast (including Alaska).....	107	3,842	968,482	3	515	294,194	104	3,327	674,288	.....	.....	.....
Great Lakes and St. Lawrence River.....	124	20,402	2,593,475	34	6,336	1,580,050	88	13,652	951,108	2	414	62,317
Mississippi River and its tributaries.....	37	3,804	473,091	4	750	84,000	32	2,800	358,091	1	254	31,000
Canals and other inland waters of New York state.....	6	195	31,200	1	12	3,000	5	183	28,200	.....	.....	.....
All other inland waters.....	16	370	15,850	.....	.....	.....	16	370	15,850	.....	.....	.....
SAIL.												
Freight and passenger.....	2,357	1,156,354	58,273,449	144	275,989	20,288,764	2,213	880,365	37,984,685	.....	.....	.....
Atlantic coast and Gulf of Mexico.....	1,972	790,630	40,824,576	85	119,834	9,048,773	1,887	670,796	31,775,803	.....	.....	.....
Pacific coast (including Alaska).....	264	220,929	13,169,036	34	70,645	7,898,000	230	150,284	5,271,036	.....	.....	.....
Great Lakes and St. Lawrence River.....	119	144,657	4,278,137	25	85,510	3,341,991	94	59,147	936,146	.....	.....	.....
Mississippi River and its tributaries.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canals and other inland waters of New York state.....	1	30	200	.....	.....	.....	1	30	200	.....	.....	.....
All other inland waters.....	1	108	1,500	.....	.....	.....	1	108	1,500	.....	.....	.....
Fishing vessels.....	1,738	48,565	3,552,512	3	69	4,700	1,735	48,496	3,547,812	.....	.....	.....
Atlantic coast and Gulf of Mexico.....	1,718	44,524	3,392,652	3	69	4,700	1,715	44,455	3,387,952	.....	.....	.....
Pacific coast (including Alaska).....	20	4,041	159,860	.....	.....	.....	20	4,041	159,860	.....	.....	.....
Great Lakes and St. Lawrence River.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mississippi River and its tributaries.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canals and other inland waters of New York state.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other inland waters.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yachts.....	569	11,387	1,940,513	10	2,844	640,000	549	8,099	1,223,013	10	444	77,500
Atlantic coast and Gulf of Mexico.....	495	10,180	1,792,288	10	2,844	640,000	476	6,978	1,084,788	9	358	67,500
Pacific coast (including Alaska).....	29	592	71,125	.....	.....	.....	28	506	61,125	1	86	10,000
Great Lakes and St. Lawrence River.....	42	495	70,150	.....	.....	.....	42	495	70,150	.....	.....	.....
Mississippi River and its tributaries.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canals and other inland waters of New York state.....	3	120	6,950	.....	.....	.....	3	120	6,950	.....	.....	.....
All other inland waters.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous.....	76	3,433	336,533	.....	.....	.....	76	3,433	336,533	.....	.....	.....
Atlantic coast and Gulf of Mexico.....	72	2,616	314,033	.....	.....	.....	72	2,616	314,033	.....	.....	.....
Pacific coast (including Alaska).....	3	519	19,500	.....	.....	.....	3	519	19,500	.....	.....	.....
Great Lakes and St. Lawrence River.....	1	298	3,000	.....	.....	.....	1	298	3,000	.....	.....	.....
Mississippi River and its tributaries.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canals and other inland waters of New York state.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other inland waters.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

¹ Includes craft propelled by machinery.

TABLE 31.—VESSELS OF EACH OCCUPATION IN EACH DIVISION, GROUPED BY CHARACTER OF CONSTRUCTION: 1916—Continued.

CLASS, OCCUPATION, AND DIVISION.	TOTAL.			METAL.			WOOD.			COMPOSITE.		
	Number of ves-sels.	Gross tonnage.	Value of vessels.	Number of ves-sels.	Gross tonnage.	Value of vessels.	Number of ves-sels.	Gross tonnage.	Value of vessels.	Number of ves-sels.	Gross tonnage.	Value of vessels.
UNRIGGED.												
Canal boats.....	1,501	198,120	\$2,202,752	4	1,273	\$50,000	1,497	196,847	\$2,152,752	.....	.....	.....
Atlantic coast and Gulf of Mexico.....	445	63,730	914,437	4	1,273	50,000	441	62,457	864,437	.....	.....	.....
Pacific coast (including Alaska).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Great Lakes and St. Lawrence River.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mississippi River and its tributaries.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canals and other inland waters of New York state.....	651	84,696	974,095	.....	.....	.....	651	84,696	974,095	.....	.....	.....
All other inland waters.....	405	49,694	314,220	.....	.....	.....	405	49,694	314,220	.....	.....	.....
Miscellaneous.....	18,810	4,783,134	95,017,008	678	360,035	18,622,697	18,108	4,419,360	76,215,051	24	3,689	\$179,260
Atlantic coast and Gulf of Mexico.....	10,327	2,812,508	67,818,552	253	190,388	11,095,164	10,073	2,621,841	56,714,888	1	279	8,500
Pacific coast (including Alaska).....	1,673	253,561	8,063,288	22	22,011	1,455,729	1,651	231,550	6,607,559	.....	.....	.....
Great Lakes and St. Lawrence River.....	857	151,611	8,157,884	117	57,488	3,544,511	735	121,673	4,463,373	5	2,450	150,000
Mississippi River and its tributaries.....	5,539	1,501,532	9,887,449	279	89,869	2,418,868	5,242	1,410,703	7,447,821	18	960	20,760
Canals and other inland waters of New York state.....	153	18,841	584,198	1	100	80,000	152	18,741	504,198	.....	.....	.....
All other inland waters.....	261	15,081	505,637	6	229	25,425	255	14,852	477,212	.....	.....	.....

NUMBER AND TONNAGE.

The tonnage of a vessel is her carrying capacity or weight expressed in tons. Gross and net tonnage are used in tonnage figures for vessels in this report. Gross tonnage represents the cubic feet capacity below the upper deck and also that of deck house, etc., above deck, divided by 100. The net tonnage differs by reason of deducting space occupied by machinery, officers' and crews' quarters, etc., and then dividing by 100.

The minimum size of craft included in the census is "5 tons, net register." This term as used for census purposes for a documented vessel means one the internal cubical contents of which are 500 cubic feet, excluding machinery and space occupied by the crew, and in the case of a vessel not documented it was construed to mean a vessel with a carrying capacity of 10 tons of cargo of 2,000 pounds each.

The gross and net tonnage were secured without difficulty for documented craft. For the undocumented craft, however, although the gross tonnage could generally be obtained, it was not always possible to obtain a satisfactory report of the net tonnage, and in many instances estimates were accepted. For this reason the figures for gross tonnage seemed to be the more reliable and they are used, as a rule, therefore, in the tables of this report.

Nautical terms include two other tonnage units, namely, displacement tonnage and dead-weight tonnage. Displacement tonnage is used in the United States chiefly for war vessels and represents the amount of water displaced at their maximum draft, while the dead-weight tonnage represents the carrying capacity, which is about two-thirds of the displacement tonnage. The freight-carrying capacity of a vessel may be estimated by tons of 40 cubic feet.

Table 32 shows both gross and net tonnage for the the different classes of vessels, 1916 and 1906.

TABLE 32.—GROSS AND NET TONNAGE, WITH PER CENT NET IS OF GROSS TONNAGE, BY CLASS AND OCCUPATION OF VESSELS: 1916 AND 1906.

CLASS AND OCCUPATION.	GROSS TONNAGE.		NET TONNAGE.			
	1916	1906	Number of tons.		Per cent net is of gross tonnage.	
			1916	1906	1916	1906
Total.....	12,249,990	12,893,429	10,158,998	11,484,833	82.9	89.1
Steam.....	6,097,562	4,059,521	4,246,429	2,918,476	69.6	71.9
Freight and pas-senger.....	5,432,353	3,411,588	3,794,313	2,474,183	69.8	72.5
Tugs and other towing vessels.....	264,135	261,375	174,038	174,373	65.9	66.7
Ferryboats.....	224,328	261,073	154,877	187,238	69.0	71.7
Yachts.....	111,620	82,275	78,170	54,123	70.0	65.8
Miscellaneous.....	65,126	43,210	45,031	28,559	69.1	66.1
Sail.....	1,171,174	1,704,277	1,052,878	1,539,513	89.9	90.3
Freight and pas-senger.....	1,156,354	1,672,862	1,040,124	1,510,658	89.9	90.3
Yachts.....	11,387	24,155	9,619	22,176	84.5	91.8
Miscellaneous.....	3,433	7,260	3,135	6,679	91.3	92.0
Unrigged.....	4,981,254	7,129,631	4,859,691	7,026,844	97.6	98.6
Canal boats.....	195,120	303,581	186,260	292,386	94.0	96.3
Miscellaneous.....	4,783,134	6,826,050	4,673,431	6,734,458	97.7	98.7

¹ Includes craft propelled by machinery.

As a general proposition, it is found that the net register of steam vessels is about two-thirds of the gross, as shown by the figures in Table 32. The proportion in the case of sailing vessels is naturally much higher, as the space occupied by machinery and for accommodation of the crew, etc., is much less than that required by steam vessels. In unrigged craft the gross and net tonnage are almost the same, very little space being required for the accommodation of the crew.

For all classes of vessels combined, the proportion which the net tonnage constituted of the gross was less in 1916 than in 1906, which may be accounted for by the fact that steam tonnage increased considerably between 1906 and 1916, while both sail and unrigged tonnage decreased.

Table 33 shows for steam, sail, and unrigged vessels, in addition to their number, tonnage, and value, the average tonnage per vessel and value per ton and per vessel, by divisions, for 1916, 1906, and 1889.

TABLE 33.—NUMBER, GROSS TONNAGE, AND VALUE OF DIFFERENT CLASSES OF VESSELS, BY DIVISIONS: 1916, 1906, AND 1889.

DIVISION AND CLASS.	Census year.	Number of vessels.	Gross tonnage.	Value of vessels.	Average tonnage per vessel.	Average value per ton.	Average value per vessel.
Total.....	1916 1906 1889	37,894 37,321 30,485	12,249,990 12,893,429 8,359,135	\$959,925,364 507,973,121 206,992,352	323 345 274	\$78 39 25	\$25,332 13,611 6,790
Steam ¹	1916 1906 1889	14,581 9,927 5,603	6,097,562 4,059,521 1,710,073	802,155,109 396,772,727 131,567,427	418 409 305	132 95 77	55,014 38,962 23,482
Sail.....	1916 1906 1889	3,002 7,131 7,945	1,171,174 1,704,277 1,675,706	60,550,495 56,206,145 53,192,972	390 239 211	52 33 32	20,170 7,882 6,695
Unrigged.....	1916 1906 1889	20,311 20,263 16,937	4,981,254 7,129,631 4,973,356	97,219,760 64,994,249 22,231,953	245 352 294	20 9 4	4,787 3,208 1,513
Atlantic coast and Gulf of Mexico.....	1916 1906 1889	21,658 20,032 12,238	6,508,617 4,851,421 2,658,445	629,074,203 273,105,915 116,042,062	301 242 217	97 56 44	29,046 13,633 9,482
Steam ¹	1916 1906 1889	8,347 5,413 2,536	2,828,953 1,457,894 741,770	517,410,317 193,926,327 65,518,640	339 269 292	183 133 88	61,988 35,826 25,835
Sail.....	1916 1906 1889	2,539 5,920 6,277	803,426 1,132,905 1,293,192	42,930,897 37,620,903 42,685,982	316 191 206	53 33 33	16,909 6,338 6,800
Unrigged.....	1916 1906 1889	10,772 8,699 3,425	2,876,238 2,260,622 623,483	68,732,989 41,658,685 7,837,440	267 260 182	24 18 13	6,381 4,789 2,288
Pacific coast (including Alaska).....	1916 1906 1889	4,092 2,537 1,635	1,185,961 977,687 419,157	127,310,646 76,622,633 21,824,040	290 385 256	107 78 52	31,112 30,202 13,548
Steam ¹	1916 1906 1889	2,123 1,066 465	710,360 518,107 160,293	105,987,697 60,440,145 14,767,355	335 486 345	149 117 92	49,924 56,698 31,758
Sail.....	1916 1906 1889	296 666 681	222,040 305,283 195,508	13,259,661 11,533,171 6,231,340	750 453 287	60 38 32	44,796 17,317 9,150
Unrigged.....	1916 1906 1889	1,673 805 489	253,561 154,297 63,356	8,063,288 4,649,317 825,345	152 192 130	32 30 13	4,820 5,776 1,688
Great Lakes and St. Lawrence River.....	1916 1906 1889	2,856 2,990 2,737	2,737,491 2,392,863 920,294	174,765,526 130,805,640 48,580,174	959 800 336	64 55 53	61,192 43,748 17,749
Steam ¹	1916 1906 1889	1,837 1,076 1,467	2,410,430 1,915,786 595,813	162,256,355 116,983,812 40,868,824	1,312 1,143 406	67 61 69	88,327 69,799 27,859
Sail.....	1916 1906 1889	162 531 962	145,450 265,671 185,081	4,351,287 7,135,271 4,238,850	898 500 192	30 27 23	26,860 13,437 4,406
Unrigged.....	1916 1906 1889	857 783 308	181,611 211,506 139,400	8,157,884 6,686,557 3,472,500	212 270 453	45 32 25	9,519 8,540 11,274
Mississippi River and its tributaries.....	1916 1906 1889	7,239 9,622 7,300	1,621,495 4,411,967 3,364,610	23,030,503 22,852,142 14,407,162	224 459 461	14 5 4	3,181 2,375 1,974
Steam ¹	1916 1906 1889	1,700 1,435 972	119,963 146,227 192,974	13,143,054 13,196,770 9,622,608	71 102 199	110 90 50	7,731 9,196 9,900
Unrigged.....	1916 1906 1889	5,539 8,187 6,328	1,501,532 4,265,740 3,171,636	9,887,449 9,655,372 4,784,554	271 521 501	7 2 2	1,785 1,179 756
All other inland waters.....	1916 1906 1889	2,049 2,140 6,575	196,426 259,491 996,629	5,744,486 4,586,791 6,138,914	96 121 152	29 18 6	2,804 2,143 834
Steam ¹	1916 1906 1889	574 337 163	27,856 21,507 19,223	3,357,686 2,225,673 790,000	49 64 118	121 103 41	5,850 6,604 4,847
Sail.....	1916 1906 1889	5 14 25	258 518 1,925	8,650 16,800 36,800	52 37 77	34 32 19	1,730 1,200 1,472
Unrigged.....	1916 1906 1889	1,470 1,789 6,387	168,312 237,466 975,481	2,378,150 2,344,318 5,312,114	114 133 153	14 10 5	1,618 1,310 832

¹ Includes craft propelled by machinery.

The average gross tonnage per vessel, for all classes combined, decreased from 345 in 1906 to 323 in 1916, or 6.4 per cent. The average value per ton, however, increased 100 per cent, and the average value per vessel 86.1 per cent. Although the commercial valuation of the vessels is generally accepted as given by the owners, the real basis of valuation is dependent largely upon the supply and demand, which may vary at different censuses.

Vessels operating on the Great Lakes and St. Lawrence River increased in average tonnage from 800 in 1906 to 959 in 1916, or 19.9 per cent, and in average value from \$43,748 to \$61,192, or 39.9 per cent. In both 1916 and 1906, the average tonnage and value of the craft reported for this division were considerably larger than the general average for the country as a whole, or for any of the other divisions. On the Great Lakes there are many vessels of large tonnage designed for special methods of transportation and of lading, and these tend to place the average tonnage and value higher than in those divisions where a large number of small craft are included.

The Atlantic coast and Gulf of Mexico reported 57.2 per cent of the number of vessels in the United States, 53.1 per cent of the tonnage, and 65.5 per cent of the value, but the average tonnage and value were both less than in the division of the Great Lakes and St. Lawrence River, which reported only 7.5 per cent of the total number of vessels, but 22.3 per cent of the tonnage, and 18.2 per cent of the value, the relative proportions being quite different in the two sections.

The average tonnage of the steam vessels in 1906 and 1916 was largest in the division of the Great Lakes and St. Lawrence River, increasing from 1,143 tons in the earlier year to 1,312 in the later. This division also reported the greatest average value per vessel at both censuses, \$69,799 in 1906 as compared with \$88,327 in 1916. At both censuses, however, the greatest average value per ton of steam vessels was reported from the Atlantic coast and Gulf of Mexico division, increasing from \$133 per ton in 1906 to \$183 in 1916.

Steam vessels on canals and inland waters are necessarily small; it is no surprise, therefore, that the averages for "All other inland waters" in 1916 were generally the smallest, although excelling the Great Lakes division in average value per ton.

The conditions as to sailing vessels for "All other inland waters" in 1916 were identical with those for steam vessels.

The largest average value per sailing vessel in 1916, as well as the average value per ton, were shown for the Pacific coast division, the average value per ton increasing from \$38 to \$60, and the average value per vessel from \$17,317 to \$44,796. The largest average tonnage per vessel for this class in both 1906 and

1916 was shown for the Great Lakes division, increasing from 500 in 1906 to 898 in 1916.

In 1916 a great reduction appears in the average tonnage of the unrigged craft operated on the Mississippi River and its tributaries, which division led in this respect at the census of 1906.¹ The reduction in the average tonnage of unrigged craft from 521 in 1906 to 271 in 1916 was accompanied by a marked decrease in the number of such vessels; the average value per ton and per vessel, however, increased considerably. The Great Lakes and the St. Lawrence River at both censuses was first for this class of craft in average value per ton and in average value per vessel. The lowest average tonnage and value per vessel in 1916 was shown for "All other inland waters," while the lowest average value per ton was reported for the "Mississippi River and its tributaries."

In order to obtain a definite idea of the actual number of large and small vessels, as well as the relative importance of craft of different sizes, it is necessary to arrange them in groups according to their gross tonnage; this has been done in Table 34 for 1916 and 1906.

Of the total number of all classes of vessels reported at the census of 1916, the largest number, 13,660, is included in the group of from 5 to 49 gross tons. This was the case also in 1906, but the number of vessels in this group represented a greater percentage of the total in 1916, 36 per cent, as compared with 29.2 in 1906. In 1916 the tonnage for this group, 245,355, was only 2 per cent of all tonnage, while in 1906 the proportion was still less, 1.6 per cent.

As to the distribution in 1916 of the number and tonnage of vessels in this group by divisions, more than one-half was reported from the Atlantic coast and Gulf of Mexico division. Second in these particulars was the Pacific coast, including Alaska, with an increase since 1906 of 126.1 per cent in number and 124.5 per cent in tonnage. The Mississippi River and its tributaries, which at the previous census held second place by a considerable margin, was third in both number and tonnage at the later census.

In 1916 steam vessels constituted over two-thirds of the total number and nearly two-thirds of the total tonnage for vessels from 5 to 49 tons, an increase from less than one-half shown in 1906.

The largest tonnage for 1916 is shown for the group of vessels of 5,000 tons and over, which represents the largest vessels reported. The increase since 1906 in both number and tonnage of these vessels is marked, 187.9 per cent in number and 170.8 per cent in tonnage. These great vessels were all steamers in both 1916 and 1906, with the exception of three in 1916 and four in 1906, which were sailing vessels.

¹ This decrease is explained in text following Table 1 of special section for that division.

About one-half of the total number and tonnage of the vessels in this group were reported from the Great Lakes and St. Lawrence River division, the remainder being divided between the Atlantic and Pacific coasts. The former division reported about two-fifths of the total number and tonnage and the latter about one-tenth.

There was a decrease from 1906 to 1916 of 3,198, or 42.5 per cent, in the number of vessels with a tonnage

of from 500 to 2,499, accompanied by a decrease in tonnage of 3,060,382, or 45.1 per cent. While this decrease took place in all classes of vessels, the bulk of it was in the unrigged craft, due to a great reduction in this class of craft reported for the Mississippi River and its tributaries. Changes in methods of transporting coal in this section are chiefly responsible for this large decrease in unrigged craft on the Mississippi River and its tributaries.

TABLE 34.—VESSELS GROUPED ACCORDING TO GROSS TONNAGE, BY DIVISIONS: 1916 AND 1906.

DIVISION AND CLASS.	TOTAL.				5 TO 49 TONS.			
	Number of vessels.		Gross tonnage.		Number of vessels.		Gross tonnage.	
	1916	1906	1916	1906	1916	1906	1916	1906
United States.....	37,894	37,321	12,249,990	12,893,429	13,660	10,886	245,355	207,660
Steam ¹	14,581	9,927	6,097,562	4,059,521	9,431	5,068	154,424	92,344
Sail.....	3,002	7,131	1,171,174	7,704,277	1,337	4,255	26,619	72,734
Unrigged.....	20,311	20,263	4,981,254	7,129,631	2,892	1,563	64,312	42,582
Atlantic coast and Gulf of Mexico.....	21,658	20,032	6,508,617	4,851,421	7,660	7,413	136,637	133,812
Steam.....	8,347	5,413	2,828,953	1,457,894	5,575	3,019	89,833	55,988
Sail.....	2,539	5,920	803,426	1,132,905	1,229	3,792	24,497	63,191
Unrigged.....	10,772	8,699	2,876,238	2,260,622	856	602	22,307	14,633
Pacific coast (including Alaska).....	4,092	2,537	1,185,961	977,687	2,207	976	42,234	18,809
Steam.....	2,123	1,066	710,360	518,107	1,373	459	23,806	7,400
Sail.....	296	666	222,040	305,283	56	257	1,339	6,151
Unrigged.....	1,673	805	253,561	154,297	778	260	17,089	5,258
Great Lakes and St. Lawrence River.....	2,856	2,900	2,737,491	2,392,863	1,137	843	19,205	18,096
Steam.....	1,837	1,678	2,410,430	1,915,786	833	678	14,286	12,569
Sail.....	162	531	145,450	265,571	49	196	738	2,266
Unrigged.....	857	783	181,611	211,506	255	69	4,181	2,261
Mississippi River and its tributaries.....	7,239	9,622	1,621,495	4,411,967	1,971	1,383	32,942	31,759
Steam.....	1,700	1,435	119,963	146,227	1,197	788	17,866	12,346
Unrigged.....	5,539	8,187	1,501,532	4,265,740	774	595	15,076	19,413
Canals and other inland waters of New York state.....	978	1,648	115,290	209,152	159	105	3,755	1,990
Steam.....	170	151	11,603	14,127	116	80	2,410	1,523
Sail.....	4	13	150	495	3	9	45	103
Unrigged.....	804	1,484	103,537	194,530	40	16	1,300	264
All other inland waters.....	1,071	492	81,136	50,339	526	166	10,582	3,194
Steam.....	404	186	16,253	7,380	337	144	6,223	2,518
Sail.....	1	1	108	23	.....	1	.....	23
Unrigged.....	666	305	64,775	42,936	189	21	4,359	653

DIVISION AND CLASS.	50 TO 99 TONS.				100 TO 199 TONS.				200 TO 299 TONS.			
	Number of vessels.		Gross tonnage.		Number of vessels.		Gross tonnage.		Number of vessels.		Gross tonnage.	
	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906
United States.....	3,818	3,806	273,112	272,358	6,777	7,712	948,162	1,094,373	4,103	3,452	986,491	840,078
Steam ¹	1,514	1,386	112,332	101,886	928	1,034	133,143	147,917	436	418	106,197	102,032
Sail.....	335	685	22,989	47,731	180	353	26,005	51,219	118	242	29,484	60,491
Unrigged.....	1,969	1,735	137,791	122,741	5,669	6,325	789,014	895,237	3,549	2,792	850,810	677,555
Atlantic coast and Gulf of Mexico.....	1,959	2,123	138,582	151,754	3,635	3,839	523,480	549,840	2,727	2,127	657,183	513,836
Steam.....	805	763	58,682	55,734	602	590	85,381	83,092	259	225	62,893	54,840
Sail.....	307	592	21,071	40,928	166	299	23,891	42,889	104	169	25,923	41,971
Unrigged.....	847	774	58,829	55,092	2,867	2,950	414,208	423,859	2,364	1,733	568,367	417,025
Pacific coast (including Alaska).....	428	320	30,470	22,546	413	283	56,372	40,050	197	155	47,780	37,591
Steam.....	181	104	13,500	7,862	103	116	15,123	17,459	71	62	17,553	15,121
Sail.....	24	52	1,621	3,751	5	18	713	2,662	7	24	1,855	6,298
Unrigged.....	223	164	15,349	10,333	305	149	40,536	19,929	119	69	28,372	16,172
Great Lakes and St. Lawrence River.....	379	420	28,814	28,899	210	307	31,262	44,130	163	199	38,861	49,117
Steam.....	209	213	15,932	15,819	71	86	10,117	12,787	44	49	11,792	11,792
Sail.....	4	39	297	2,869	7	34	1,188	5,459	7	49	1,706	12,222
Unrigged.....	166	168	12,585	10,711	132	187	19,957	25,884	112	101	26,534	25,103
Mississippi River and its tributaries.....	792	682	56,422	48,654	1,605	1,912	227,239	295,536	849	784	203,743	196,099
Steam.....	258	265	19,917	19,991	183	183	16,960	26,898	51	76	12,422	18,839
Unrigged.....	534	417	36,505	28,663	1,495	1,729	210,279	268,638	798	708	191,321	177,260
Canals and other inland waters of New York state.....	112	193	8,323	16,244	573	1,153	67,040	136,313	123	174	29,352	40,676
Steam.....	18	17	1,334	1,145	28	45	3,613	5,924	6	4	1,446	1,006
Sail.....	.....	2	.....	183	1	2	105	209	.....	.....	.....	.....
Unrigged.....	94	174	6,989	14,918	544	1,106	63,322	130,180	117	170	27,906	39,670
All other inland waters.....	148	62	10,501	4,261	341	218	42,769	28,504	44	13	9,572	2,759
Steam.....	43	24	2,967	1,835	14	14	1,949	1,757	5	2	1,262	434
Sail.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	105	38	7,534	2,426	326	204	40,712	26,747	39	11	8,310	2,325

¹ Includes craft propelled by machinery.

TRANSPORTATION BY WATER.

TABLE 34.—VESSELS GROUPED ACCORDING TO GROSS TONNAGE, BY DIVISIONS: 1916 AND 1906—Continued.

DIVISION AND CLASS.	300 TO 399 TONS.				400 TO 499 TONS.				500 TO 999 TONS.			
	Number of vessels.		Gross tonnage.		Number of vessels.		Gross tonnage.		Number of vessels.		Gross tonnage.	
	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906
United States.....	2,278	1,843	771,450	631,247	2,011	1,552	885,004	677,488	3,239	4,175	2,089,678	2,654,477
Steam ¹	220	257	76,383	89,640	195	215	86,794	96,145	499	527	356,124	368,661
Sail.....	90	205	31,146	71,241	91	224	40,927	100,797	502	718	371,688	517,208
Unrigged.....	1,968	1,381	663,921	470,366	1,725	1,113	757,283	480,546	2,238	2,930	1,361,866	1,770,608
Atlantic coast and Gulf of Mexico.....	1,711	1,429	581,103	486,094	1,324	869	577,888	380,276	1,665	1,441	1,123,087	997,370
Steam.....	109	107	38,141	37,370	115	115	50,800	51,113	235	249	167,763	176,096
Sail.....	72	137	24,835	47,615	65	155	28,826	69,299	364	485	278,460	356,998
Unrigged.....	1,530	1,185	518,127	401,109	1,144	599	498,262	259,864	1,066	707	676,864	464,276
Pacific coast (including Alaska).....	106	118	35,736	40,612	175	98	76,247	44,079	284	361	200,303	243,497
Steam.....	51	60	17,343	20,512	45	50	19,989	22,324	133	105	96,142	71,257
Sail.....	11	30	3,788	10,429	14	30	6,485	13,804	98	156	66,880	108,095
Unrigged.....	44	28	14,605	9,671	116	18	49,773	7,951	53	100	37,311	64,145
Great Lakes and St. Lawrence River.....	120	150	42,150	58,549	75	148	33,852	66,770	188	279	132,071	193,546
Steam.....	39	49	13,484	17,138	23	28	10,495	12,757	85	115	62,019	82,850
Sail.....	7	38	2,523	13,197	12	39	5,616	17,694	40	77	26,378	52,115
Unrigged.....	74	72	26,143	28,154	40	81	17,741	36,319	63	87	43,674	58,581
Mississippi River and its tributaries.....	333	105	109,878	34,990	436	424	196,567	181,044	1,092	2,087	627,783	1,215,430
Steam.....	20	39	7,092	13,893	12	21	5,510	9,432	43	56	27,866	34,824
Unrigged.....	313	66	102,786	21,097	424	403	191,057	171,562	1,049	2,031	599,917	1,180,606
Canals and other inland waters of New York state.....	6	1	1,900	300	1	11	450	4,400	1	7	600	4,634
Steam.....	.....	1	.....	300	.....	.....	.....	.....	.....	2	.....	1,634
Sail.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	6	.....	1,900	.....	1	11	450	4,400	1	5	600	3,000
All other inland waters.....	2	31	683	10,702	.....	2	.....	919	9	.....	5,834	.....
Steam.....	1	1	323	367	.....	1	.....	469	3	.....	2,334	.....
Sail.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	1	30	360	10,335	.....	1	.....	450	6	.....	3,500	.....

DIVISION AND CLASS.	1,000 TO 2,499 TONS.				2,500 TO 4,999 TONS.				5,000 TONS AND OVER.			
	Number of vessels.		Gross tonnage.		Number of vessels.		Gross tonnage.		Number of vessels.		Gross tonnage.	
	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906
United States.....	1,088	3,350	1,637,119	4,132,702	563	421	2,070,511	1,517,661	357	124	2,343,108	865,885
Steam ¹	489	548	831,593	924,492	515	354	1,912,501	1,293,364	354	120	2,327,981	845,040
Sail.....	303	388	465,362	581,046	43	57	141,827	181,465	3	4	15,127	20,345
Unrigged.....	296	2,414	340,164	2,627,164	5	10	16,093	42,832	.....	.....	.....	.....
Atlantic coast and Gulf of Mexico.....	555	585	847,013	852,007	279	169	968,958	556,311	143	31	954,686	230,121
Steam.....	241	184	402,798	289,359	263	131	917,976	429,399	143	30	954,686	224,908
Sail.....	216	262	324,941	380,716	16	28	50,982	84,080	.....	1	.....	5,218
Unrigged.....	98	139	119,274	181,932	.....	10	.....	42,832	.....	.....	.....	.....
Pacific coast (including Alaska).....	200	177	310,739	271,166	48	34	161,760	109,680	34	15	224,320	149,657
Steam.....	93	62	148,902	99,677	39	33	133,682	106,838	34	15	224,320	149,657
Sail.....	73	98	114,341	151,251	8	1	25,048	2,842	.....	.....	.....	.....
Unrigged.....	34	17	47,496	20,238	1	.....	3,030	.....	.....	.....	.....	.....
Great Lakes and St. Lawrence River.....	168	339	307,381	596,479	236	218	939,793	851,670	180	78	1,164,102	485,607
Steam.....	143	293	263,568	522,907	213	190	860,933	757,127	177	75	1,148,975	470,480
Sail.....	14	28	26,080	49,079	19	28	65,797	94,543	3	3	15,127	15,127
Unrigged.....	11	18	17,733	24,493	4	.....	13,063	.....	.....	.....	.....	.....
Mississippi River and its tributaries.....	161	2,245	166,921	2,408,455	.....	.....	.....	.....	.....	.....	.....	.....
Steam.....	9	7	12,330	9,954	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	152	2,238	154,591	2,398,501	.....	.....	.....	.....	.....	.....	.....	.....
Canals and other inland waters of New York state.....	3	4	3,870	4,595	.....	.....	.....	.....	.....	.....	.....	.....
Steam.....	2	2	2,800	2,595	.....	.....	.....	.....	.....	.....	.....	.....
Sail.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	1	2	1,070	2,000	.....	.....	.....	.....	.....	.....	.....	.....
All other inland waters.....	1	.....	1,195	.....	.....	.....	.....	.....	.....	.....	.....	.....
Steam.....	1	.....	1,195	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sail.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

¹ Includes craft propelled by machinery.

The increase since 1906 in vessels with a tonnage of from 2,500 to 4,999 was large, 142, or 33.7 per cent, in number and 552,850, or 36.4 per cent, in tonnage. This increase was due entirely to steam vessels, these increasing by 161, or 45.5 per cent, in number and by 619,227, or 47.9 per cent, in tonnage. The reduction in the number and tonnage of sailing vessels and unrigged craft in this group was more than overcome by the growth in the steam vessels.

Motor boats were not reported separately in 1906 but were included with steam vessels, hence in comparing such statistics for 1916 with those for 1906 it was necessary to combine the two classes. In 1916 motor boats were reported separately from the regular steam vessels, and their number, tonnage, and value for 1916 are shown in Table 35 for that year, together with similar data for the other classes shown in Table 34.

Steam vessels represented a rather small proportion of the total number of vessels in the country, only 15.2 per cent, but their tonnage formed 47.9 per cent of the total tonnage for all vessels and their value 78.8 per cent. Although the comparatively small steam vessels, those of less than 100 gross tons, represented 44.3 per cent of the total number of all such

craft, they formed only 2.4 per cent of the total steam tonnage; the large steamers, those of 1,000 tons or more, on the other hand, forming only 20.6 per cent of the number, represented 84.8 per cent of the total tonnage. There were 353 steam vessels of 5,000 or more tons each, the average tonnage of which was 6,579.

TABLE 35.—ALL VESSELS, GROUPED ACCORDING TO GROSS TONNAGE, BY DIVISIONS AND CLASS, WITH PER CENT OF TOTAL: 1916.

DIVISION AND CLASS.	TOTAL.						5 TO 49 TONS.			
	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Value of vessels.	Per cent of total.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.
United States.....	43,110	100.0	12,395,236	100.0	\$979,388,633	100.0	18,283	100.0	315,015	100.0
Steam.....	6,532	15.2	5,943,388	47.9	772,054,054	78.8	1,629	8.9	47,229	15.0
Motor.....	11,527	26.7	250,855	2.0	46,011,812	4.7	10,914	69.7	184,906	49.2
Sail.....	4,740	11.0	1,219,739	9.8	64,103,007	6.5	2,848	15.6	48,668	16.4
Unrigged.....	20,311	47.1	4,981,254	40.2	97,219,760	9.9	2,892	15.8	64,312	20.4
Atlantic coast and Gulf of Mexico.....	25,387	100.0	6,614,197	100.0	642,114,328	100.0	10,920	100.0	182,751	100.0
Steam.....	3,396	13.4	2,734,189	41.3	498,229,447	77.6	734	6.7	22,093	12.1
Motor.....	6,982	27.4	155,820	2.4	28,828,343	4.5	6,597	60.4	92,014	50.3
Sail.....	4,257	16.8	847,950	12.8	46,323,549	7.2	2,733	25.0	40,337	25.4
Unrigged.....	10,772	42.4	2,876,238	43.5	68,732,989	10.7	856	7.8	22,307	12.2
Pacific coast (including Alaska).....	4,962	100.0	1,215,303	100.0	132,524,924	100.0	2,972	100.0	56,653	100.0
Steam.....	798	16.1	677,414	55.7	99,685,156	75.2	126	4.2	3,873	6.8
Motor.....	2,175	43.8	55,247	4.8	11,373,959	8.6	2,005	67.5	34,243	60.4
Sail.....	316	6.4	226,081	18.6	13,419,521	10.1	63	2.1	1,448	2.6
Unrigged.....	1,673	33.7	253,561	20.9	8,063,288	6.1	778	26.2	17,089	30.2
Great Lakes and St. Lawrence River.....	3,462	100.0	2,747,687	100.0	175,956,392	100.0	1,724	100.0	28,204	100.0
Steam.....	1,362	39.3	2,404,763	87.5	160,533,324	91.2	375	21.8	10,568	37.5
Motor.....	1,081	31.2	15,863	0.6	2,913,897	1.7	1,045	60.6	12,717	45.1
Sail.....	162	4.7	145,450	5.3	4,351,287	2.5	49	2.8	738	2.6
Unrigged.....	857	24.8	181,611	6.6	8,157,884	4.6	255	14.8	4,181	14.8
Mississippi River and its tributaries.....	7,247	100.0	1,621,687	100.0	23,044,903	100.0	1,979	100.0	33,034	100.0
Steam.....	636	8.8	103,115	6.4	10,870,444	47.2	167	8.4	5,013	15.2
Motor.....	1,072	14.8	16,940	1.0	2,287,010	9.9	1,033	52.5	12,945	39.2
Sail.....	5,539	76.4	1,501,532	92.6	9,887,449	42.9	774	39.1	15,076	45.6
All other inland waters.....	2,052	100.0	196,462	100.0	5,748,086	100.0	688	100.0	14,373	100.0
Steam.....	340	16.6	23,907	12.2	2,752,683	47.9	227	33.0	5,682	39.5
Motor.....	237	11.5	3,985	2.0	608,603	10.6	229	33.3	2,987	20.8
Sail.....	5	0.2	258	0.1	8,650	0.2	3	0.4	45	0.3
Unrigged.....	1,470	71.6	168,312	85.7	2,378,150	41.4	229	33.3	5,659	39.4

DIVISION AND CLASS.	50 TO 99 TONS.				100 TO 199 TONS.				200 TO 299 TONS.			
	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.
United States.....	4,092	100.0	292,696	100.0	7,009	100.0	978,803	100.0	4,158	100.0	1,000,335	100.0
Steam.....	1,263	30.9	95,279	32.6	932	13.3	134,109	13.7	459	11.0	112,261	11.2
Motor.....	428	10.5	29,642	10.1	113	1.6	14,893	1.5	28	0.7	6,756	0.7
Sail.....	432	10.6	29,994	10.2	295	4.2	40,787	4.2	122	2.9	30,508	3.0
Unrigged.....	1,969	48.1	137,791	47.1	5,699	80.9	789,014	80.6	3,549	85.4	850,810	85.1
Atlantic coast and Gulf of Mexico.....	2,159	100.0	153,285	100.0	3,838	100.0	550,024	100.0	2,773	100.0	668,677	100.0
Steam.....	663	30.7	49,262	32.1	610	15.9	86,811	15.8	293	10.6	71,556	10.7
Motor.....	245	11.3	17,128	11.2	82	2.1	10,657	1.9	12	0.4	2,831	0.4
Sail.....	404	18.7	28,066	18.3	279	7.3	38,348	7.0	104	3.8	25,923	3.9
Unrigged.....	847	39.2	58,829	38.4	2,867	74.7	414,208	75.3	2,364	85.3	568,367	85.0
Pacific coast (including Alaska).....	483	100.0	34,154	100.0	442	100.0	60,469	100.0	206	100.0	50,130	100.0
Steam.....	117	24.2	9,061	26.5	107	24.2	15,714	26.0	65	31.6	16,174	32.3
Motor.....	119	24.6	8,123	23.8	23	5.2	3,181	5.3	11	5.3	2,705	5.4
Sail.....	24	5.0	1,621	4.7	7	1.6	1,038	1.7	11	5.3	2,879	5.7
Unrigged.....	223	46.2	15,349	44.9	305	69.0	40,536	67.0	119	57.8	28,372	56.6
Great Lakes and St. Lawrence River.....	398	100.0	30,011	100.0	210	100.0	31,262	100.0	163	100.0	38,861	100.0
Steam.....	200	50.3	15,251	50.8	65	31.0	9,312	29.8	42	25.8	10,158	26.1
Motor.....	28	7.0	1,878	6.3	6	2.9	805	2.6	2	1.2	463	1.2
Sail.....	4	1.0	297	1.0	7	3.3	1,188	3.8	7	4.3	1,706	4.4
Unrigged.....	166	41.7	12,585	41.9	132	62.9	19,957	63.8	112	68.7	26,534	68.3
Mississippi River and its tributaries.....	792	100.0	56,422	100.0	1,605	100.0	227,239	100.0	849	100.0	203,743	100.0
Steam.....	226	28.5	17,659	31.3	110	6.9	16,960	7.5	50	5.9	12,158	6.0
Motor.....	32	4.0	2,258	4.0	.....	.....	.....	.....	1	0.1	264	0.1
Sail.....	534	67.4	36,505	64.7	1,495	92.1	210,279	92.5	798	94.0	191,321	93.9
All other inland waters.....	260	100.0	18,824	100.0	914	100.0	109,809	100.0	167	100.0	38,924	100.0
Steam.....	57	21.9	4,046	21.5	40	4.4	5,312	4.8	9	5.4	2,215	5.7
Motor.....	4	1.5	255	1.4	2	0.2	250	0.2	2	1.2	493	1.3
Sail.....	.....	.....	.....	.....	2	0.2	213	0.2	.....	.....	.....	.....
Unrigged.....	199	76.5	14,523	77.2	870	95.2	104,034	94.7	156	93.4	36,216	93.0

TABLE 35.—ALL VESSELS, GROUPED ACCORDING TO GROSS TONNAGE, BY DIVISIONS AND CLASS, WITH PER CENT OF TOTAL: 1916—Continued.

DIVISION AND CLASS.	300 TO 399 TONS.				400 TO 499 TONS.				500 TO 999 TONS.			
	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.
United States.....	2,304	100.0	779,958	100.0	2,015	100.0	886,774	100.0	3,241	100.0	2,090,917	100.0
Steam.....	223	9.7	77,135	9.9	193	9.6	85,964	9.7	490	15.1	349,930	16.7
Motor.....	13	0.6	4,409	0.6	5	0.2	2,132	0.2	11	0.3	7,433	0.4
Sail.....	100	4.3	34,493	4.4	92	4.6	41,395	4.7	502	15.5	371,688	17.8
Unrigged.....	1,968	85.4	663,921	85.1	1,725	85.6	757,283	85.4	2,238	69.1	1,361,866	65.1
Atlantic coast and Gulf of Mexico.....	1,728	100.0	586,445	100.0	1,326	100.0	578,771	100.0	1,666	100.0	1,123,587	100.0
Steam.....	117	6.8	40,614	6.9	113	8.5	49,959	8.6	230	13.8	164,499	14.6
Motor.....	5	0.3	1,637	0.3	4	0.3	1,724	0.3	6	0.4	3,764	0.3
Sail.....	76	4.4	26,067	4.4	65	4.9	28,826	5.0	394	21.8	278,460	24.8
Unrigged.....	1,530	88.5	518,127	88.3	1,144	86.3	498,262	86.1	1,066	64.0	676,864	60.2
Pacific coast (including Alaska).....	115	100.0	38,902	100.0	177	100.0	77,134	100.0	285	100.0	201,042	100.0
Steam.....	46	40.0	15,622	40.2	45	25.4	20,000	25.9	129	45.3	93,212	46.4
Motor.....	8	7.0	2,772	7.1	1	0.6	408	0.5	5	1.8	3,668	1.8
Sail.....	17	14.8	5,903	15.2	15	8.5	6,958	9.0	98	34.4	66,850	33.2
Unrigged.....	44	38.3	14,605	37.5	116	65.5	49,773	64.5	53	18.6	37,311	18.6
Great Lakes and St. Lawrence River.....	120	100.0	42,150	100.0	75	100.0	33,852	100.0	188	100.0	132,071	100.0
Steam.....	39	32.5	13,484	32.0	23	30.7	10,495	31.0	85	45.2	62,019	47.0
Motor.....	7	5.8	2,523	6.0	12	16.0	5,616	16.6	40	21.3	26,378	20.0
Sail.....	74	61.7	26,143	62.0	40	53.3	17,741	52.4	63	33.5	43,674	33.1
Unrigged.....	74	61.7	26,143	62.0	40	53.3	17,741	52.4	63	33.5	43,674	33.1
Mississippi River and its tributaries.....	333	100.0	109,878	100.0	436	100.0	196,567	100.0	1,092	100.0	627,783	100.0
Steam.....	20	6.0	7,092	6.5	12	2.8	5,510	2.8	43	3.9	27,866	4.4
Motor.....	313	94.0	102,786	93.5	424	97.2	191,057	97.2	1,049	96.1	599,917	95.6
Sail.....	313	94.0	102,786	93.5	424	97.2	191,057	97.2	1,049	96.1	599,917	95.6
Unrigged.....	313	94.0	102,786	93.5	424	97.2	191,057	97.2	1,049	96.1	599,917	95.6
All other inland waters.....	8	100.0	2,583	100.0	1	100.0	450	100.0	10	100.0	6,434	100.0
Steam.....	1	12.5	323	12.5					3	30.0	2,334	36.3
Motor.....	1	12.5	323	12.5					3	30.0	2,334	36.3
Sail.....	7	87.5	2,260	87.5	1	100.0	450	100.0	7	70.0	4,100	63.7
Unrigged.....	7	87.5	2,260	87.5	1	100.0	450	100.0	7	70.0	4,100	63.7

DIVISION AND CLASS.	1,000 TO 2,499 TONS.				2,500 TO 4,999 TONS.				5,000 TONS AND OVER.			
	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.
United States.....	1,088	100.0	1,637,119	100.0	563	100.0	2,070,511	100.0	357	100.0	2,343,108	100.0
Steam.....	476	43.7	809,619	49.5	514	91.3	1,909,341	92.2	353	98.9	2,322,521	99.1
Motor.....	13	1.2	21,974	1.3	1	0.2	3,250	0.2	1	0.3	5,460	0.2
Sail.....	303	27.8	465,362	28.4	43	7.6	141,827	6.8	3	0.8	15,127	0.6
Unrigged.....	296	27.2	340,164	20.8	5	0.9	16,093	0.8				
Atlantic coast and Gulf of Mexico.....	555	100.0	847,013	100.0	279	100.0	968,958	100.0	143	100.0	954,686	100.0
Steam.....	232	41.8	335,443	45.5	262	93.9	914,726	94.4	142	99.3	949,226	99.4
Motor.....	9	1.6	17,355	2.0	1	0.4	3,250	0.3	1	0.7	5,460	0.6
Sail.....	216	38.9	324,941	38.4	16	5.7	50,982	5.3				
Unrigged.....	98	17.7	119,274	14.1								
Pacific coast (including Alaska).....	200	100.0	310,739	100.0	48	100.0	161,760	100.0	34	100.0	224,320	100.0
Steam.....	90	45.0	145,756	46.9	39	81.3	133,682	82.6	34	100.0	224,320	100.0
Motor.....	3	1.5	3,146	1.0								
Sail.....	73	36.5	114,341	36.8	8	16.7	25,048	15.5				
Unrigged.....	34	17.0	47,496	15.3	1	2.1	3,030	1.9				
Great Lakes and St. Lawrence River.....	168	100.0	307,381	100.0	236	100.0	939,793	100.0	180	100.0	1,164,102	100.0
Steam.....	143	85.1	263,568	85.7	213	90.3	860,933	91.6	177	98.3	1,148,975	98.7
Motor.....	14	8.3	26,090	8.5	19	8.0	65,797	7.0	3	1.7	15,127	1.3
Sail.....	11	6.5	17,733	5.8	4	1.7	12,063	1.4				
Unrigged.....	11	6.5	17,733	5.8	4	1.7	12,063	1.4				
Mississippi River and its tributaries.....	161	100.0	166,921	100.0								
Steam.....	8	5.0	10,857	6.5								
Motor.....	1	0.6	1,473	0.9								
Sail.....	152	94.4	154,591	92.6								
Unrigged.....	152	94.4	154,591	92.6								
All other inland waters.....	4	100.0	5,065	100.0								
Steam.....	3	75.0	3,995	78.9								
Motor.....	3	75.0	3,995	78.9								
Sail.....	1	25.0	1,070	21.1								
Unrigged.....	1	25.0	1,070	21.1								

More than one-fourth of the total number of all classes of vessels in 1916 were motor boats, but the proportions which their tonnage and value formed of the corresponding total, were insignificant. Over nine-tenths of these boats were of less than 50 gross tons, the average tonnage being only 22, and the average value \$3,992. There were 15 motor boats, or vessels having auxiliary power, of over 1,000 tons each, 11 of which were on the Atlantic coast, 3 on the Pacific coast, and 1 on the Mississippi River.

About one-tenth of the total number and tonnage of all vessels in the United States were sail vessels. The majority of these, 69.2 per cent, were craft of less than 100 gross tons, while only 7.4 per cent were vessels with a tonnage of 1,000 or over.

The table also shows that unrigged craft constituted nearly one-half of the total number of vessels in 1916, with a tonnage amounting to two-fifths of the total. The value of these craft, however, was a little less than one-tenth of the total value reported for all ves-

sels. There were only five unrigged craft with a tonnage of 2,500 or more, four of which were operated on the Great Lakes and one on the Pacific coast.

VALUATION OF VESSELS.

At the census of 1916, as in 1906 and 1889, the inquiry as to value of vessels or craft was intended to ascertain their commercial value. There was consid-

erable variation in 1889, however, in reporting the valuation of vessels. In some cases it was reported as the vessel's cost; in other cases, the basis was the amount that might be realized by sale; and in still others, the value was given with the idea that it might be used as a basis for taxation. Similar variations probably occurred to some extent in 1916, but not sufficiently to affect the general reliability of the figures.

TABLE 36.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CLASS AND CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.

	NUMBER OF VESSELS.			GROSS TONNAGE.			VALUE OF VESSELS.		
	1916	1906	1889	1916	1906	1889	1916	1906	1889
Aggregate.....	37,894	37,321	30,485	12,240,990	12,893,429	8,359,135	\$959,925,364	\$507,973,121	\$206,992,352
Metal.....	3,298	1,979	548	5,814,903	3,276,723	525,218	725,373,070	306,229,289	50,918,319
Wood.....	34,477	35,247	29,834	6,376,401	9,581,348	7,793,259	227,930,398	199,135,582	153,552,913
Composite.....	119	95	103	58,686	35,358	40,658	6,621,896	2,608,250	2,521,120
Steam ¹	14,581	9,927	5,603	6,097,562	4,059,521	1,710,073	802,155,109	386,772,727	131,567,427
Metal.....	2,462	1,674	534	5,174,712	2,916,517	515,003	685,771,609	289,689,438	50,153,519
Wood.....	12,034	8,197	5,033	868,297	1,119,459	1,173,860	110,018,364	95,026,589	79,538,108
Composite.....	85	56	36	54,553	23,545	21,210	6,365,136	2,056,700	1,875,800
Sail.....	3,002	7,131	7,945	1,171,174	1,704,277	1,675,706	60,550,495	56,206,145	53,192,972
Metal.....	154	131	14	278,833	227,959	10,215	20,928,764	10,598,751	764,800
Wood.....	2,838	6,973	7,864	891,897	1,476,656	1,646,043	39,544,231	45,165,894	51,782,852
Composite.....	10	27	67	444	5,662	19,448	77,500	441,500	645,320
Unrigged.....	20,311	20,263	16,937	4,981,254	7,129,631	4,973,356	97,219,760	64,994,249	22,231,953
Metal.....	682	174		361,358	132,247		18,672,697	5,941,100	
Wood.....	19,605	20,077	16,937	4,616,207	6,991,233	4,973,356	78,367,803	58,943,099	22,231,953
Composite.....	24	12		3,689	6,151		179,260	110,050	

¹ Includes craft propelled by machinery. ² Includes a few craft of metal construction which were not segregated in 1889. ³ Includes one scow made of concrete.

TABLE 37.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, PER CENT OF TOTAL, AND PER CENT OF INCREASE, BY CLASS AND CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.

	NUMBER OF VESSELS.					GROSS TONNAGE.					VALUE OF VESSELS.				
	Per cent of total.			Per cent of increase. ¹		Per cent of total.			Per cent of increase. ¹		Per cent of total.			Per cent of increase. ¹	
	1916	1906	1889	1906-1916	1889-1916	1916	1906	1889	1906-1916	1889-1916	1916	1906	1889	1906-1916	1889-1916
Aggregate.....	100.0	100.0	100.0	1.5	24.3	100.0	100.0	100.0	-5.0	46.5	100.0	100.0	100.0	89.0	363.7
Metal.....	8.7	5.3	1.8	66.6	501.8	47.5	25.4	6.3	77.5	(²)	75.6	60.3	24.6	136.9	(²)
Wood.....	91.0	94.4	97.9	-2.2	15.6	52.1	74.3	93.2	-33.4	-18.2	23.7	39.2	74.2	14.5	48.4
Composite.....	0.3	0.3	0.3		15.5	0.5	0.3	0.5	66.0	44.3	0.7	0.5	1.2	153.9	162.7
Steam ¹	100.0	100.0	100.0	46.9	160.2	100.0	100.0	100.0	50.2	256.6	100.0	100.0	100.0	107.4	509.7
Metal.....	16.9	16.9	9.5	47.1	361.0	84.9	71.8	30.1	77.4	(²)	85.5	74.9	38.1	136.7	(²)
Wood.....	82.5	82.6	89.8	46.8	139.1	14.2	27.6	68.6	-22.4	-26.0	13.7	24.6	60.5	15.8	38.3
Composite.....	0.6	0.6	0.6			0.9	0.6	1.2	131.7	157.2	0.8	0.5	1.4	209.5	239.3
Sail.....	100.0	100.0	100.0	-57.9	-62.2	100.0	100.0	100.0	-31.3	-30.1	100.0	100.0	100.0	7.7	13.8
Metal.....	5.1	1.8	0.2	17.6		23.8	13.4	0.6	22.3	(²)	34.6	18.9	1.4	97.5	(²)
Wood.....	94.5	97.8	99.0	-59.3	-63.9	76.2	86.3	98.2	-39.4	-45.8	65.3	80.4	97.3	-12.4	-23.6
Composite.....	0.3	0.4	0.8			(²)	0.3	1.2	-92.2	-97.7	0.1	0.8	1.2	-82.4	-88.0
Unrigged.....	100.0	100.0	100.0	0.2	19.9	100.0	100.0	100.0	-30.1	0.2	100.0	100.0	100.0	49.6	337.3
Metal.....	3.4	0.9		292.0		7.3	1.9		173.2		19.2	9.1		214.3	
Wood.....	96.5	99.1	100.0	-2.4	15.8	92.7	98.1	100.0	-34.0	-7.2	80.6	90.7	100.0	33.0	252.5
Composite.....	0.1	0.1				0.1	0.1		-40.0		0.2	0.2		62.9	

¹ A minus sign (-) denotes decrease. Percentages are omitted when base is less than 100.

² Percentages omitted where figures are known not to be comparable.

³ Includes craft propelled by machinery.

⁴ Less than one-tenth of 1 per cent

During the decade 1906-1916 the value of all vessels, irrespective of construction, increased \$451,952,243, or 89 per cent. During the 17 years from 1889 to 1906 the increase, \$300,980,769, was not so great in absolute gain but was relatively much greater, 145.4 per cent. For the entire 27 years the increase was \$752,933,012, or 363.7 per cent.

An analysis of the value of vessels, by character of construction, in 1916, shows that 75.6 per cent of the

total value was reported for vessels of metal construction, compared with 60.3 per cent in 1906, and only 24.6 per cent in 1889. The increase in the value of metal vessels amounted to \$419,143,781, or 136.9 per cent, for the decade 1906-1916, and \$255,310,970, or 501.4 per cent, from 1889 to 1906.

Vessels of wooden construction increased substantially in value from 1889 to 1906 and from 1906 to 1916, although to a less degree, but the proportion which the

value of such vessels formed of the total decreased from 74.2 per cent in 1889 to 39.2 per cent in 1906 and to 23.7 per cent in 1916.

The value of vessels of composite construction, although forming a very small proportion of the total at each census, shows a large actual and relative increase during the decade 1906-1916, amounting to \$4,013,646, or 153.9 per cent.

From 1906 to 1916 the total valuation of steam vessels increased \$415,382,382, or 107.4 per cent, representing more than nine-tenths of the total increase for all kinds of vessels. The value of sail vessels increased \$4,344,350, or 7.7 per cent, and that of unrigged craft \$32,225,511, or 49.6 per cent.

Table 38 shows the number, gross tonnage, and value of vessels by occupation and character of construction.

TABLE 38.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CHARACTER OF CONSTRUCTION AND BY CLASS AND OCCUPATION: 1916, 1906, AND 1889.

CLASS AND OCCUPATION.	Census year.	TOTAL.			METAL.			WOOD.			COMPOSITE.		
		Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.
Aggregate.....	1916	37,894	12,249,990	\$959,925,364	3,298	5,814,903	\$725,373,070	34,477	6,376,401	\$227,930,398	119	58,686	\$6,621,896
	1906	37,321	12,983,429	507,973,121	1,979	3,276,723	306,229,289	35,247	9,581,348	199,135,582	95	35,358	2,608,250
	1889	30,485	8,359,135	206,992,352	548	525,218	50,918,319	29,834	7,793,259	153,552,913	103	40,658	2,521,120
Steam ¹	1916	14,581	6,097,562	802,155,109	2,462	5,174,712	685,771,609	12,034	868,297	110,018,364	85	54,553	6,365,186
	1906	9,927	4,059,521	386,772,727	1,674	2,916,517	289,689,438	8,197	1,119,459	95,026,589	56	23,545	2,056,700
	1889	5,603	1,710,073	131,567,427	534	515,003	50,153,519	5,033	1,173,860	79,538,108	36	21,210	1,875,800
Freight and passenger.....	1916	5,362	5,432,353	677,475,337	1,440	4,869,180	620,481,652	3,877	513,195	51,569,885	45	49,978	5,423,800
	1906	3,615	3,411,588	286,218,089	908	2,623,551	238,475,331	2,690	768,557	46,634,758	17	19,180	1,108,000
	1889	2,429	1,290,552	90,999,834	296	413,411	38,802,099	2,111	856,979	50,589,735	22	20,162	1,608,000
Tugs and other towing vessels.....	1916	3,689	264,135	54,909,495	581	96,930	26,098,625	3,096	165,856	28,575,588	12	1,349	235,282
	1906	3,079	261,375	39,062,249	420	83,902	14,574,417	2,649	176,513	24,383,332	10	960	104,500
	1889	1,950	146,447	17,364,413	107	9,157	1,761,800	1,837	137,054	15,580,813	6	236	21,800
Ferryboats.....	1916	611	224,328	23,227,174	166	140,151	15,641,062	441	83,305	7,481,675	4	872	104,437
	1906	536	261,073	29,578,380	156	151,406	19,839,598	379	109,253	9,715,782	1	414	23,000
	1889	456	146,104	10,442,750	60	40,925	3,976,500	396	105,179	6,466,250	.....	.....	.....
Yachts.....	1916	3,785	111,620	33,447,143	179	44,528	16,610,324	3,587	65,514	16,345,319	19	1,578	491,500
	1906	2,176	82,275	24,281,861	134	38,294	12,524,020	2,016	41,643	11,036,641	26	2,338	721,200
	1889	230	13,586	3,858,810	25	4,864	1,649,720	202	8,369	2,074,090	3	353	135,000
Miscellaneous.....	1916	1,134	65,126	13,095,960	96	23,923	6,939,946	1,033	40,427	6,045,897	5	776	110,117
	1906	521	43,210	7,632,148	56	19,364	4,276,072	463	3,256,076	4,827,220	2	653	100,000
	1889	538	113,384	8,901,620	46	46,646	3,963,400	487	66,279	.....	5	459	111,000
Sail.....	1916	3,002	1,171,174	60,550,495	154	278,833	20,928,764	2,838	891,897	39,544,231	10	444	77,500
	1906	7,131	1,704,277	56,206,145	131	227,959	10,598,751	6,973	1,470,656	45,165,894	27	5,662	441,500
	1889	7,945	1,675,706	53,192,972	14	10,215	764,800	7,864	1,646,043	51,782,852	67	19,448	645,320
Freight and passenger.....	1916	2,357	1,156,354	58,273,449	144	275,989	20,288,764	2,213	880,365	37,984,685	.....	.....	.....
	1906	5,181	1,672,862	51,415,756	110	225,613	9,832,451	5,069	1,442,556	41,347,305	2	4,693	236,000
	1889	6,863	1,641,846	49,166,617	8	9,734	554,500	6,795	1,612,875	47,996,047	60	19,237	615,070
Yachts.....	1916	569	11,387	1,940,513	10	2,844	640,000	549	8,099	1,223,013	10	444	77,500
	1906	1,594	24,155	4,169,253	21	2,346	760,300	1,549	20,954	3,202,453	24	855	200,500
	1889	653	15,040	2,750,755	6	481	210,300	644	14,487	2,519,955	3	72	20,500
Miscellaneous.....	1916	76	3,433	336,533	.....	.....	.....	76	3,433	336,533	.....	.....	.....
	1906	356	7,260	621,136	.....	.....	.....	355	7,146	616,136	1	114	5,000
	1889	429	18,820	1,276,600	.....	.....	.....	425	18,681	1,266,850	4	139	9,750
Unrigged.....	1916	20,311	4,981,254	97,219,760	682	361,358	18,672,697	19,605	4,616,207	78,367,803	24	3,689	179,260
	1906	20,263	7,120,631	64,994,249	174	132,247	5,941,100	20,077	6,961,233	58,943,099	12	6,151	110,050
	1889	16,937	4,973,356	22,231,953	.....	.....	.....	16,937	4,973,356	22,231,953	.....	.....	.....

¹ Includes craft propelled by machinery. ² Includes one scow made of concrete.

³ Includes a few craft of metal construction which were not segregated in 1889.

Vessels classed as freight and passenger were by far the most important of all steam craft, their valuation in 1916 constituting 84.5 per cent of the total of all steam vessels and 70.6 per cent of the aggregate valuation for all classes of vessels in the United States. These proportions are marked increases over those for 1906 and 1889, which were 74 and 56.3 per cent, respectively, for 1906, and 69.2 and 44 per cent for 1889. For the 10-year period 1906 to 1916 the actual increase in the valuation of these freight and passenger steam vessels was \$391,257,248 and the relative increase 136.7 per cent, due almost wholly to the gain in the value of vessels of metal construction.

The value of tugs and other towing vessels in 1916 represented 6.8 per cent of the total for the steam class and 5.7 per cent of the aggregate of all classes

for the United States. The increase from 1906 to 1916 in the valuation was \$15,847,246, or 40.6 per cent, compared with \$21,697,836, or 125 per cent, for the 17 years 1889 to 1906. As in the case of freight and passenger vessels, increased metal construction was largely responsible for increased valuation.

The marked decrease from 1906 to 1916 in the tonnage and valuation of ferryboats is due to the decrease in their use, owing to new tunnel and bridge construction, chiefly in New York, mentioned elsewhere in this report. While the valuation of these craft in 1906 showed an increase of \$19,135,630, or 183.2 per cent, over the figures for 1889, there was a decrease of \$6,351,206, or 21.5 per cent, from 1906 to 1916. In 1906 the valuation of ferryboats was 7.6 per cent of the valuation of all steam vessels and 5.8

per cent of the valuation of vessels of all kinds; in 1916 these proportions had decreased to 2.9 and 2.4 per cent, respectively.

The valuation of steam yachts in 1916 constituted 4.2 per cent of the total value of steam vessels and 3.5 per cent of the aggregate for the United States; in 1906 the proportions were 6.3 and 4.8 per cent, respectively. The absolute increase in the valuation of steam yachts from 1906 to 1916 was \$9,165,282, or 37.7 per cent. Between 1889 and 1906 the increase was \$20,423,051, or 529.3 per cent. The value of sail yachts constituted only 3.4 per cent of the total value of all sailing vessels in 1916 and two-tenths of 1 per cent of the aggregate for the United States as compared with 7.4 and eight-tenths of 1 per cent in 1906. There was an increase in the value of these yachts from 1889 to 1906 of \$1,418,498, or 51.6 per cent, but

a decrease of \$2,228,740, or 53.5 per cent, from 1906 to 1916.

The value of steam craft classified as miscellaneous shows a large increase, \$5,463,812, or 71.6 per cent, since 1906, while sail vessels so classified, although comparatively of small value, show a decided decrease. The value of the miscellaneous class of vessels decreased from 4.9 per cent of the total value of all vessels in 1889 to 1.6 per cent in 1906, and 1.4 per cent in 1916.

The tonnage of sailing vessels of composite construction, classed as "freight and passenger" and "miscellaneous," was insignificant in 1889 and in 1906, and none was reported in 1916.

Table 39 shows the average gross tonnage and value per vessel and the average value per ton, by occupation and character of construction, 1916, 1906, and 1889.

TABLE 39.—AVERAGE GROSS TONNAGE AND VALUE PER VESSEL AND AVERAGE VALUE PER TON, BY CHARACTER OF CONSTRUCTION AND BY CLASS AND OCCUPATION: 1916, 1906, AND 1889.

CLASS AND OCCUPATION.	Census year.	TOTAL.			METAL.			WOOD.			COMPOSITE.		
		Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.
Aggregate.....	1916	323	\$25,332	\$78	1,763	\$219,943	\$125	185	\$6,611	\$36	493	\$55,646	\$113
	1906	345	13,611	39	1,656	154,739	93	272	5,650	21	372	27,455	74
	1889	274	6,790	25	958	92,917	97	261	5,147	20	395	24,477	62
Steam ¹	1916	418	55,014	132	2,102	278,542	133	72	9,142	127	642	74,884	117
	1906	409	38,962	95	1,742	173,052	99	137	11,593	85	420	36,727	87
	1889	305	23,482	77	964	93,920	97	233	15,803	68	569	52,106	83
Freight and passenger.....	1916	1,013	126,348	125	3,381	430,890	127	132	13,301	100	1,111	120,529	109
	1906	944	79,175	84	2,889	282,638	91	286	17,336	61	1,128	65,176	58
	1889	531	37,464	71	1,397	131,088	94	406	23,965	59	916	73,091	80
Tugs and other towing vessels.....	1916	72	14,885	208	167	44,920	269	64	9,230	172	112	19,607	174
	1906	85	12,687	149	200	34,701	174	67	9,205	138	96	10,450	109
	1889	75	8,905	119	86	16,465	192	75	8,482	114	39	3,633	92
Ferryboats.....	1916	367	38,015	104	844	94,223	112	189	16,965	90	218	26,109	120
	1906	487	55,184	113	971	127,177	131	288	25,635	89	414	23,000	55
	1889	320	22,901	71	682	66,275	97	266	16,329	61			
Yachts.....	1916	29	8,837	300	249	92,795	373	18	4,557	249	83	25,868	311
	1906	38	11,159	295	286	98,463	327	21	5,475	265	90	27,738	308
	1889	59	16,777	284	195	65,989	339	41	10,268	248	118	45,000	382
Miscellaneous.....	1916	57	11,548	201	249	72,291	290	39	5,853	150	155	22,023	142
	1906	83	14,649	177	346	76,358	221	50	7,033	140	327	50,000	153
	1889	211	16,546	79	1,014	86,161	85	136	9,912	73	92	22,200	242
Sail.....	1916	390	20,170	52	1,811	135,901	75	314	13,934	44	44	7,750	175
	1906	239	7,882	33	1,740	80,906	46	211	6,477	31	210	16,352	78
	1889	211	6,695	32	780	54,629	75	209	6,585	31	290	9,632	33
Freight and passenger.....	1916	491	24,724	50	1,917	140,894	74	398	17,164	43			
	1906	323	9,924	31	2,051	89,386	44	285	8,157	29	2,347	118,000	50
	1889	239	7,164	30	1,217	69,313	57	237	7,063	30	321	10,251	32
Yachts.....	1916	20	3,410	170	284	64,000	225	15	2,228	151	44	7,750	175
	1906	15	2,616	173	112	36,490	327	14	2,067	153	36	8,354	235
	1889	23	4,212	183	80	35,060	437	22	3,913	174	24	6,833	285
Miscellaneous.....	1916	45	4,428	98				45	4,428	98			
	1906	20	1,745	86				20	1,736	86	114	5,000	44
	1889	44	2,976	68				44	2,981	68	35	2,438	70
Unrigged.....	1916	245	4,787	20	530	27,379	52	235	3,997	17	154	7,469	49
	1906	352	3,208	9	760	34,144	45	348	2,936	8	513	9,171	18
	1889	294	1,313	4				294	1,313	4			

¹ Includes craft propelled by machinery.

² Includes a few craft of metal construction which were not segregated in 1889.

There was a very large increase from 1906 to 1916 in the actual number, tonnage, and value of vessels of metal construction, while those of wooden construction decreased in both number and tonnage, but increased somewhat in total value. The composite vessels show increases in all three particulars during

the same period. In 1916 the vessels of largest average tonnage were freight and passenger steamers of metal construction, but, with the exception of ferryboats, the average value per ton was the least of any of the five classes shown by occupation. Of the aggregate for all classes, metal construction shows the

greatest average tonnage and value per vessel and value per ton at each census, and wood the smallest.

Sailing vessels of metal construction are shown in but two occupation classes, freight and passenger and yachts. The freight and passenger were the larger in average tonnage and value per vessel, but were greatly exceeded by yachts in average value per ton. It is noticeable, however, that while the per ton value of yachts decreased in 1916, as compared with 1906, that for freight and passenger vessels nearly doubled.

The lowest average tonnage and value per vessel in 1916 were shown for sailing yachts of wooden construction, and the lowest average value per ton was for unrigged craft, also of wood.

CHARACTER OF POWER AND MACHINE PROPULSION.

The number of steam and motor vessels, by character of propulsion and their gross tonnage and horsepower, are shown in Table 40 for 1916 and 1906, with per cent of increase and per cent of total.

TABLE 40.—VESSELS PROPELLED BY STEAM AND MOTOR, BY CHARACTER OF PROPULSION, GROSS TONNAGE, AND HORSEPOWER, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916 AND 1906.

	Total.	Steam.	Motor.	PER CENT OF TOTAL.	
				Steam.	Motor.
Number of vessels:					
1916.....	14,581	6,044	8,537	41.5	58.5
1906.....	9,927	6,765	3,162	68.1	31.9
Per cent of increase ¹	46.9	-10.7	170.0		
Screw:					
1916.....	12,726	4,880	7,846	38.3	61.7
1906.....	7,952	5,160	2,792	64.9	35.1
Per cent of increase ¹	60.0	-5.4	181.0		
Stern wheel:					
1916.....	1,421	772	649	54.3	45.7
1906.....	1,406	1,055	351	75.0	25.0
Per cent of increase ¹	1.1	-26.8	84.9		
Side wheel:					
1916.....	433	391	42	90.3	9.7
1906.....	562	543	19	96.6	3.4
Per cent of increase ¹	-23.0	-28.0			
All other:					
1916.....	1	1		100.0	
1906.....	7	7		100.0	
Gross tonnage:					
1916.....	6,097,562	5,899,711	197,851	96.8	3.2
1906.....	4,059,521	4,008,431	51,090	98.7	1.3
Per cent of increase.....	50.2	47.2	287.3		
Horsepower:					
1916.....	4,599,073	4,264,770	334,303	92.7	7.3
1906.....	3,451,745	3,378,453	73,292	97.9	2.1
Per cent of increase.....	33.2	26.2	356.1		

¹ A minus sign (-) denotes decrease. Percentages are omitted when base is less than 100.

Of the total horsepower reported in 1916 for all vessels propelled by machinery, 4,264,770, or 92.7 per cent, was steam and 334,303, or 7.3 per cent, was motor. In 1906 the corresponding proportions were 97.9 and 2.1 per cent, respectively.

Although a few comparatively large craft are propelled by motors, the average tonnage of all the motor vessels reported at the census of 1916 was 23.2 and the average horsepower 39.2. At the census of 1906 the corresponding averages were 16.2 and 23.2, respectively. Evidently the motor craft of 1916 were of larger tonnage and greater horsepower than in 1906. A negligible number of these boats were of electric propulsion.

Considering character of propulsion, it is found that 12,726, or 87.3 per cent, of the vessels reported for 1916, whether steam or motor, were equipped with the screw propeller, an increase of 4,774, or 60 per cent, over the number reported for 1906. Of the remainder, 1,421, or 9.7 per cent, were equipped with stern wheels, a gain of 15, or 1.1 per cent, over 1906, while 433, or 3 per cent, were side-wheelers in 1916, a loss of 129, or 23 per cent, as compared with 1906.

Referring to steam vessels only, 3,685,253, or 86.4 per cent, of their horsepower in 1916 was applied by means of the screw propeller as compared with 2,717,649, or 80.4 per cent, in 1906. In 1916 the one vessel in the "all other" class was a catamaran pleasure boat with a wheel operated by steam and located in the center of the boat between the two parallel hulls.

The decrease in the number of vessels operated by steam is notable, but this taken in connection with the increased figures for tonnage shows that the newer steamers on the average were of larger tonnage than those reported for 1906.

In the case of motor boats, the horsepower of all vessels increased regardless of the type of propeller with which they were fitted. Motor vessels equipped with screw propellers, however, increased their proportion of the total horsepower from 91.7 per cent in 1906 to 94.8 per cent in 1916, while those equipped with stern wheels show a decrease in this respect from 7.8 per cent in 1906 to 4.8 per cent in 1916. The small proportion which the horsepower of motor boats propelled by side wheels formed of the total was the same at each census, four-tenths of 1 per cent.

With its great reach of coast and numerous seaports, it is not surprising that the Atlantic coast and Gulf of Mexico division during the 10 years covered by Table 41 not only maintained first rank in total amount of horsepower but increased its lead. At the census of 1916 this division reported 56.5 per cent of all horsepower, as compared with 50.9 per cent at the census of 1906. The Great Lakes and St. Lawrence River

ranked second at both censuses, but its proportion of the total horsepower decreased from 28.5 per cent in 1906 to 23.2 per cent in 1916. The other divisions followed in the order named: The Pacific coast (including Alaska) with 14.6 per cent of the total in 1916 and 12.9 per cent in 1906; the Mississippi River and its tribu-

taries, with 4.8 per cent in 1916 and 6.9 per cent in 1906; "All other inland waters," with six-tenths of 1 per cent in 1916 and three-tenths of 1 per cent in 1906; and "Canals and other inland waters of New York state," with three-tenths of 1 per cent in 1916 and five-tenths of 1 per cent in 1906.

TABLE 41.—CHARACTER OF POWER AND PROPULSION, BY DIVISIONS: 1916 AND 1906.

DIVISION.	Census year.	TOTAL.			SCREW.					
		Number of vessels.	Gross tonnage.	Horsepower.	Steam.			Motor.		
					Number of vessels.	Gross tonnage.	Horsepower.	Number of vessels.	Gross tonnage.	Horsepower.
Total.....	1916	14,581	6,097,562	4,599,073	4,880	5,424,326	3,685,253	7,846	185,887	316,987
	1906	9,927	4,059,521	3,451,745	5,160	3,424,972	2,717,649	2,792	40,251	67,240
Per cent of increase ¹		46.9	50.2	33.2	-5.4	58.4	35.6	181.0	301.9	371.4
Atlantic coast and Gulf of Mexico.....	1916	8,347	2,828,953	2,597,427	2,849	2,491,461	2,180,236	5,085	122,889	197,103
	1906	5,413	1,457,894	1,758,378	2,907	1,135,578	1,413,088	1,951	33,727	45,433
Per cent of increase ¹		54.2	94.0	47.7	-2.0	119.4	52.9	160.6	264.4	333.8
Pacific coast (including Alaska).....	1916	2,123	710,360	672,958	542	563,908	517,037	1,380	39,496	66,160
	1906	1,068	518,107	445,717	607	408,849	357,503	330	30,496	10,372
Per cent of increase ¹		99.2	37.1	51.0	6.9	37.9	44.6	318.2	531.8	537.9
Great Lakes and St. Lawrence River.....	1916	1,837	2,410,430	1,066,169	1,119	2,346,388	954,233	682	11,926	29,679
	1906	1,676	1,915,786	982,555	1,396	1,862,244	912,947	220	3,127	5,695
Per cent of increase ¹		9.6	25.8	8.5	-19.8	26.0	4.5	210.0	281.4	421.1
Mississippi River and its tributaries.....	1916	1,700	119,963	219,434	104	9,156	29,776	501	8,258	17,276
	1906	1,435	146,227	236,969	130	6,652	18,326	226	2,182	4,098
Per cent of increase ¹		18.5	-18.0	-7.4	-20.0	37.6	62.5	121.7	278.5	321.6
Canals and other inland waters of New York state.....	1916	170	11,603	15,191	102	6,461	9,572	46	1,428	2,321
	1906	151	14,127	17,767	107	8,109	10,324	31	536	828
Per cent of increase ¹		12.6	-17.9	-14.5	-4.7	-20.3	-7.3	.....	166.4	180.3
All other inland waters.....	1916	404	16,253	27,894	164	6,952	14,399	152	1,891	4,448
	1906	186	7,380	10,359	113	3,540	5,461	34	428	814
Per cent of increase.....		117.2	120.2	169.3	45.1	96.4	163.7	.....	341.8	446.4

DIVISION.	Census year.	STERN WHEEL.						SIDE WHEEL.						ALL OTHER.		
		Steam.			Motor.			Steam.			Motor.			Steam.		
		Number of vessels.	Gross tonnage.	Horsepower.	Number of vessels.	Gross tonnage.	Horsepower.	Number of vessels.	Gross tonnage.	Horsepower.	Number of vessels.	Gross tonnage.	Horsepower.	Number of vessels.	Gross tonnage.	Horsepower.
Total.....	1916	772	133,248	189,845	649	10,451	16,074	391	342,048	389,552	42	1,513	1,242	1	89	120
	1906	1,055	193,208	247,020	351	4,592	5,747	543	389,927	413,152	19	247	305	7	924	632
Per cent of increase ¹		-26.8	-31.0	-23.1	84.9	127.6	179.7	-28.0	-12.1	-5.7	512.6	307.2	.....	-90.4	-81.0	.....
Atlantic coast and Gulf of Mexico.....	1916	85	7,613	9,577	71	1,585	2,236	256	205,387	228,245	1	19	30	.....	.....	.....
	1906	157	17,226	19,557	26	395	533	368	270,831	279,675	2	22	30	2	115	62
Per cent of increase ¹		-45.9	-55.8	-51.0	301.3	319.5	-30.4	-24.2	-18.4	.....	.....	.....	.....	.....	.....	.....
Pacific coast (including Alaska).....	1916	146	53,625	51,071	7	158	467	38	52,378	37,760	10	795	463	.....	.....	.....
	1906	184	67,364	54,271	7	175	208	34	35,394	23,246	4	74	117	.....	.....	.....
Per cent of increase ¹		-20.7	-20.4	-5.9	.....	-9.7	124.5	.....	48.0	62.4	.....	295.7	.....	.....	.....	.....
Great Lakes and St. Lawrence River.....	1916	.....	.....	.....	1	15	20	34	51,939	82,137	1	162	100	.....	.....	.....
	1906	6	859	880	2	24	13	51	49,339	62,985	.....	.....	.....	1	193	35
Per cent of increase.....		.....	.....	.....	.....	.....	.....	.....	5.3	30.4	.....	.....	.....	.....	.....	.....
Mississippi River and its tributaries.....	1916	479	68,057	124,853	536	8,087	12,240	51	25,803	34,565	28	513	604	1	89	120
	1906	678	104,476	169,210	312	3,929	4,911	72	28,221	39,731	13	151	158	4	616	535
Per cent of increase ¹		-29.4	-34.9	-26.2	71.8	105.8	149.2	.....	-8.6	-13.0	.....	239.7	282.3	.....	-85.6	-77.6
Canals and other inland waters of New York state.....	1916	15	842	1,415	4	57	158	2	2,800	1,700	1	15	25	.....	.....	.....
	1906	5	562	265	.....	.....	.....	8	4,920	6,350	.....	.....	.....	.....	.....	.....
Per cent of increase ¹.....		.....	49.8	434.0	.....	.....	.....	.....	-43.1	-73.2	.....	.....	.....	.....	.....	.....
All other inland waters.....	1916	47	3,111	2,929	30	549	953	10	3,741	5,145	1	9	20	.....	.....	.....
	1906	25	2,721	2,837	4	69	82	10	622	1,165	.....	.....	.....	.....	.....	.....
Per cent of increase.....		.....	14.3	3.2	.....	.....	.....	.....	501.4	341.6	.....	.....	.....	.....	.....	.....

¹ A minus sign (-) denotes decrease. Percentages are omitted when base is less than 100.

Table 42 shows the number of machinery propelled vessels, by character of propulsion and the total horsepower of steam and motor vessels, by occupation, with per cent of increase: 1916 and 1906.

TABLE 42.—CHARACTER OF PROPULSION AND HORSEPOWER OF STEAM VESSELS,¹ BY OCCUPATION, WITH PER CENT OF INCREASE: 1916 AND 1906.

OCCUPATION.	Census year.	CHARACTER OF PROPULSION.					HORSEPOWER OF ENGINES.		
		Total.	Screw (number).	Side wheel (number).	Stern wheel (number).	All other (number).	Total.	Steam.	Motor.
Total.....	1916	14,581	12,726	433	1,421	1	4,599,073	4,264,770	334,303
	1906	9,927	7,952	562	1,406	7	3,451,745	3,378,453	73,292
Per cent of increase ²		46.9	60.0	-23.0	1.1		33.2	26.2	356.1
Freight and passenger.....	1916	5,362	4,705	217	440		3,263,339	3,167,780	95,559
	1906	3,615	2,766	285	564		2,275,712	2,255,295	20,417
Per cent of increase ²		48.3	70.1	-23.9	-22.0		43.4	40.5	368.0
Tugs and other towing vessels.....	1916	3,689	2,954	19	716		704,293	655,831	48,462
	1906	3,079	2,428	27	624		645,286	637,950	7,336
Per cent of increase.....		19.8	21.7		14.7		9.1	2.8	560.6
Ferryboats.....	1916	611	274	178	158	1	230,096	223,610	6,486
	1906	536	188	228	113	7	265,659	264,414	1,245
Per cent of increase ²		14.0	45.7	-21.9	39.8		-13.4	-12.0	423.0
Yachts.....	1916	3,785	3,714	8	63		291,221	142,264	148,957
	1906	2,176	2,093	7	76		201,983	162,032	39,951
Per cent of increase ²		73.9	77.4				44.2	-12.2	272.8
Miscellaneous.....	1916	1,134	1,079	11	44		110,124	75,285	34,839
	1906	521	477	15	29		63,105	58,762	4,343
Per cent of increase.....		117.7	126.2				74.5	28.1	702.2

¹ Includes craft propelled by machinery.

² A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

Although the total horsepower of each class of steam craft shown by occupation, except ferryboats and yachts, actually increased during the decade, the relative proportions of the total shown for the different classes changed slightly. The horsepower reported for freight and passenger craft increased from 65.9 per cent of the total in 1906 to 71 per cent in 1916, while that of tugs and other towing vessels and of ferryboats decreased from 18.7 and 7.7 per cent, respectively, to 15.3 and 5 per cent. Yachts and miscellaneous craft show slightly increased proportions of the total in 1916, that of yachts forming 6.3 per cent in 1916 as compared with 5.9 per cent in 1906 and of miscellaneous craft 2.4 per cent in 1916 and 1.8 per cent in 1906.

There was an increase in the total number of vessels engaged in the various occupations shown, and all classes of vessels equipped with screw propellers show substantial increases in number between 1906 and 1916.

Of the freight and passenger craft in 1916, all but 12.3 per cent were equipped with screw propellers; of the tugs, all but 19.9 per cent; of the yachts, all but 1.9 per cent; and of vessels of miscellaneous occupation, all but 4.9 per cent. Less than half, 44.3 per cent, of the ferryboats, however, were thus equipped.

The increase in the number of vessels fitted with stern wheels was slight, only 1.1 per cent. In this character of propulsion tugs led, mostly operated on the Mississippi River division, with an increase of 14.7 per cent since 1906; freight and passenger vessels ranked second, although showing considerable loss since 1906; and ferryboats third, with an increase during the decade of 39.8 per cent.

The number of vessels equipped with side wheels formed a small proportion of the total in both 1916 and 1906, and each of the several classes of vessels so equipped, except yachts, which increased from 7 to 8, showed decreases during this period.

INCOME.

A close study of the figures of gross income are unsatisfactory, because it is impracticable to associate them with the length and frequency of trip or voyage and character of cargo, and they must be accepted, therefore, only as showing general conditions. Too much reliance can not fairly be placed on average income per vessel or per ton, nor upon earnings compared with the value shown for vessels. Nevertheless, some study of conditions other than that based on mere comparison of increase or decrease in total gross income by geographic divisions, or even by occupation, is desirable. This perhaps is best afforded by a comparison of average earnings by gross tonnage at each census. Subject, therefore, to criticism already noted—the absence of any statement as to relative length of voyage, frequency of trips, character of cargo, and differences in freight and passenger rates, all of which particulars it is impracticable to secure fully in a limited inquiry like that undertaken in a general census—the averages may be accepted as illustrative of the general changes in earnings of shipping from one census to another.

Table 43 shows the gross income, by divisions and occupations, with per cent of increase for 1916 and 1906.

TABLE 43.—GROSS INCOME—ALL VESSELS AND CRAFT, BY DIVISIONS AND OCCUPATIONS, WITH PER CENT OF INCREASE: 1916 AND 1906.

DIVISION AND OCCUPATION.	TOTAL.		FREIGHT.		PASSENGER.		ALL OTHER.		PER CENT OF INCREASE, 1906-1916.			
	1916	1906	1916	1906	1916	1906	1916	1906	Total.	Freight.	Passenger.	All other.
Total.....	\$563,736,367	\$294,854,532	\$422,773,417	\$175,545,361	\$52,958,670	\$43,645,365	\$88,004,280	\$75,663,806	91.2	140.8	21.3	16.3
Freight and passenger.....	423,966,259	193,565,044	368,070,543	151,823,094	42,548,358	33,147,901	13,347,358	8,594,049	119.0	142.4	28.4	55.3
Towing vessels and unrigged craft.....	118,577,386	80,562,881	54,683,175	23,673,211	182,537	80,423	63,711,674	58,809,247	47.2	131.0	127.0	12.2
All other.....	21,192,722	20,726,607	19,699	49,056	10,227,775	10,417,041	10,945,248	10,260,510	2.2	-59.8	-1.8	6.7
Atlantic coast and Gulf of Mexico.....	376,806,060	159,759,924	288,158,996	83,890,161	31,475,454	25,643,332	57,171,610	50,226,431	135.9	243.5	22.7	13.8
Freight and passenger.....	275,509,040	92,096,983	241,563,075	68,185,461	24,794,470	18,208,365	9,151,495	5,703,162	199.2	254.3	36.2	60.5
Towing vessels and unrigged craft.....	87,689,998	54,727,996	46,593,413	15,697,425	9,161	46,254	41,087,424	38,984,317	60.2	196.8	-80.2	5.4
All other.....	13,607,022	12,934,940	2,508	7,275	6,671,823	7,388,713	6,932,691	5,538,952	5.2	-65.5	-9.7	25.2
Pacific coast (including Alaska).....	80,215,193	48,520,139	56,561,447	29,340,102	11,571,416	10,424,493	12,082,330	8,755,544	65.3	92.8	11.0	38.0
Freight and passenger.....	65,330,908	37,969,854	53,644,047	28,155,569	9,312,452	8,375,705	2,374,409	1,438,580	72.1	90.5	11.2	65.1
Towing vessels and unrigged craft.....	11,313,936	6,238,856	2,915,893	1,184,118	40,996	10,208	8,357,047	5,044,530	81.3	146.3	301.6	65.7
All other.....	3,570,349	4,311,429	1,507	415	2,217,968	2,038,580	1,350,874	2,272,434	-17.2	263.1	8.8	-40.6
Great Lakes and St. Lawrence River.....	85,095,887	65,274,702	70,377,339	52,076,533	6,879,005	4,866,904	7,839,543	8,331,265	30.4	36.1	41.3	-5.9
Freight and passenger.....	76,838,885	56,850,553	69,143,942	51,150,376	6,190,830	4,408,880	1,504,113	1,291,297	35.2	35.2	40.4	16.5
Towing vessels and unrigged craft.....	6,501,955	7,067,422	1,226,575	889,511	2,095	1,168	5,273,285	6,176,743	-8.0	37.9	79.4	-14.6
All other.....	1,755,047	1,356,727	6,822	36,646	686,080	456,856	1,062,145	863,225	29.4	-81.4	50.2	23.0
Mississippi River and its tributaries.....	17,439,746	17,342,038	5,671,446	7,450,869	2,404,703	2,281,243	9,363,597	7,609,926	0.6	-23.9	5.4	23.0
Freight and passenger.....	5,312,501	5,934,629	3,459,046	4,038,002	1,643,781	1,766,581	209,074	130,046	-10.5	-14.3	-7.0	60.8
Towing vessels and unrigged craft.....	9,948,718	9,342,145	2,211,800	3,412,867	129,404	15,780	7,607,514	5,913,498	6.5	-35.2	720.1	28.6
All other.....	2,178,527	2,065,264	631,518	631,518	498,882	1,547,009	1,566,382	1,566,382	5.5	26.6	-1.2	-1.2
Canals and other inland waters of New York state.....	2,138,557	2,781,604	1,146,162	2,198,920	145,509	264,397	846,886	318,287	-23.1	-47.9	-45.0	166.1
Freight and passenger.....	280,888	387,489	98,057	108,648	142,138	259,037	40,693	19,804	-27.5	-9.7	-45.1	105.5
Towing vessels and unrigged craft.....	1,833,346	2,388,965	1,048,105	2,090,272	800	1,350	784,441	297,343	-23.3	-49.9	-40.7	163.8
All other.....	24,323	5,150	2,571	4,010	2,571	4,010	21,752	1,140	372.3	.....	.....	1,808.1
All other inland waters.....	2,040,924	1,176,125	858,027	588,776	482,583	164,996	700,314	422,353	73.5	45.7	192.5	65.8
Freight and passenger.....	694,037	325,531	161,776	185,038	464,687	129,333	67,574	11,160	113.2	-12.6	259.3	505.5
Towing vessels and unrigged craft.....	1,289,433	797,497	687,389	399,018	81	5,663	601,963	392,816	61.7	72.3	-98.6	53.2
All other.....	57,454	53,097	8,862	4,720	17,815	30,000	30,777	18,377	8.2	87.8	-40.6	67.5

A minus sign (—) denotes decrease.

Vessels employed in the fisheries were not reported at the census of 1906, and as Table 43 shows data for both 1916 and 1906, statistics for such craft, even though taken for 1916, are not included.

As the greatest part of the tonnage of tugs is devoted to the towing of barges carrying or lightering freight, and their income is derived from this source, the earnings from the two classes of vessels have been combined in Table 43. Some duplication necessarily arises in such a combination, since the towing charges were sometimes included in receipts shown for the tows although returned separately by the independent tugs. This duplication, however, is not of sufficient importance to seriously affect the comparative figures in this table.

As shown in Table 2, the gross tonnage of the active vessels decreased 5 per cent between 1906 and 1916, while the gross income increased 91.2 per cent, and the estimated commercial value of the craft increased 89 per cent. In 1906 for every \$100 value of vessels there was \$58 of gross income; in 1916 this had risen to \$59. The figures on which these averages are based include yachts and boats owned by local governments. A comparatively small amount of revenue was reported for yachts, representing mostly

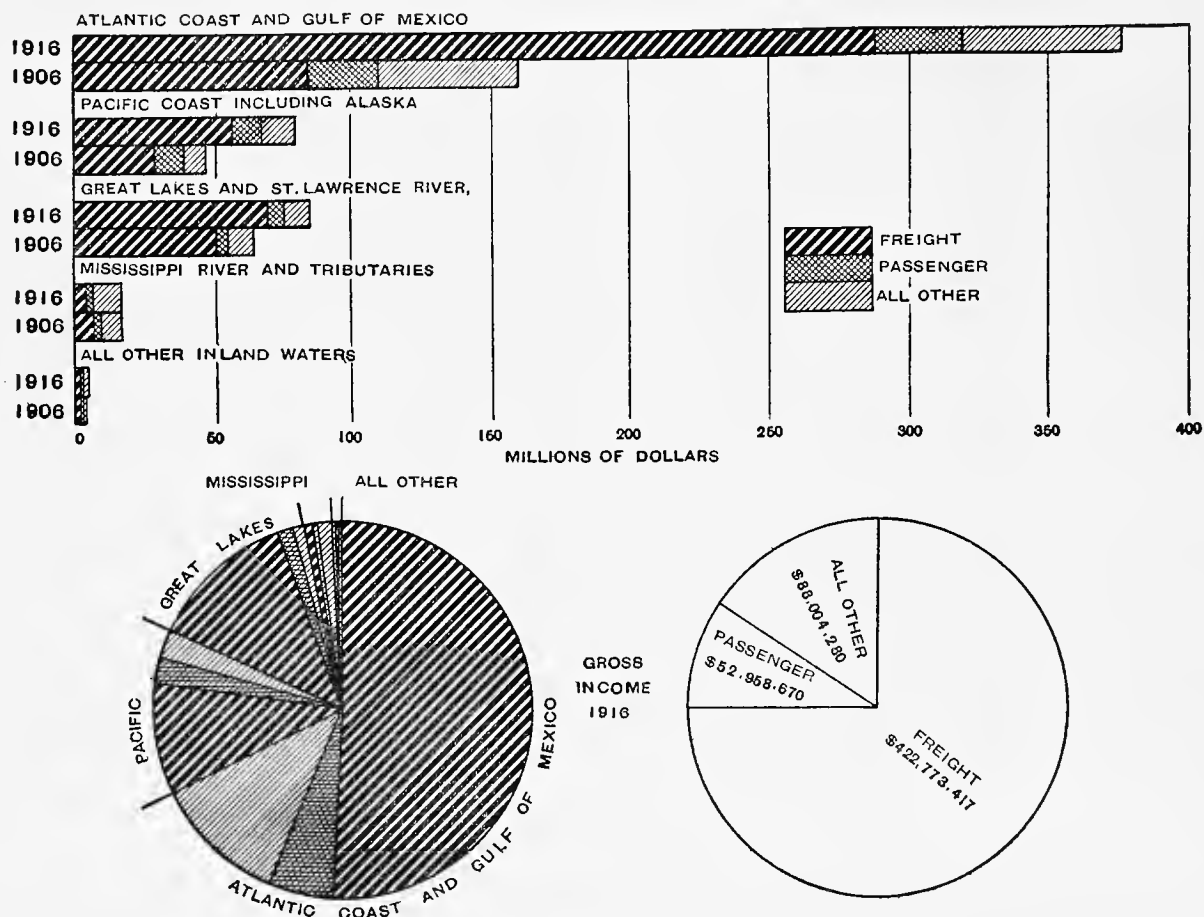
earnings from pleasure and fishing parties, etc. If the figures for these two classes of boats be excluded from the totals for 1916 there remain 33,066 vessels with a gross tonnage of 12,044,095, valued at \$913,390,433, or \$76 per ton and \$27,623 per vessel. The gross income from these vessels for the year was \$561,041,328, or \$61 for each \$100 of value. These figures should be compared with those for 1906, when similar craft were reported to the number of 33,236, with a gross tonnage of 12,724,260, valued at \$471,481,311, or \$37 per ton and \$14,186 per vessel. Their gross income was \$291,648,400, or \$62 for each \$100 of value. These figures are confusing, since when based on the valuation of vessels, a decrease is shown during the decade for each \$100 of value, but a comparison of income based on tonnage shows that in 1916 there was \$47 of gross income for each ton operated in 1916 as compared with \$23 in 1906. It is evident that the income did not increase proportionately with the values placed upon the vessels.

The receipts from freight in 1916, all craft being considered, represented 75 per cent of the total gross income, leaving 9.4 per cent for receipts from passengers, and 15.6 per cent for such as was reported from all other sources, towing, chartering, lightering, etc.

Freight receipts more than doubled from 1906 to 1916, while income from passengers increased only about one-fifth. In this connection it should not be forgotten

that although there was a large increase in tons of freight carried in 1916 compared with 1906, there was a decrease in the number of passengers.

DIAGRAM 6.—INCOME OF VESSELS, BY DIVISIONS AND BY OCCUPATION: 1916 AND 1906.



More than two-thirds of the receipts from freight and about three-fifths of those from passengers were reported from the Atlantic and Gulf coasts in 1916. The Great Lakes and St. Lawrence River division was second in proportion of receipts from freight, with nearly one-sixth of the total income from that source, and the Pacific coast third, with considerably more than one-eighth. In passenger receipts and receipts from "all other" sources, the Pacific coast retained second place, having substantially one-fifth and one-seventh of the respective totals. While reporting a decrease in receipts from freight, the division of the Mississippi River and its tributaries reported a considerable gain in passenger receipts and in receipts from "all other" sources.

In absolute increases the Atlantic coast and Gulf of Mexico division led in receipts from freight, from passengers, and from all other sources, and also in relative increase in income from freight, but the divisions of the Great Lakes and St. Lawrence River and "All other inland waters" exceeded it in rate of gain in receipts from passengers, the percentages for these

two divisions being 41.3 and 192.5 per cent, respectively, compared with 22.7 per cent for the Atlantic coast. Four of the divisions exceeded the Atlantic and Gulf coasts in the rate of increase in receipts from "all other" sources. "Canals and other inland waters of New York state," although comparatively small, led with a gain of 166.1 per cent. For the Atlantic and Gulf coasts, while the actual gain was large, the relative gain was only 13.8 per cent.

In considering average earnings based on the tonnage of vessels for the different divisions, in both 1916 and 1906, the highest average was shown for the Pacific coast, \$68 for 1916 and \$50 for 1906. The Atlantic coast and Gulf of Mexico division was second in both years, but its average increased much more than that of any other division, from \$33 in 1906 to \$58 in 1916. The Great Lakes and St. Lawrence River division was third in this respect, with \$31 in 1916 and \$27 in 1906. The smallest averages in both years were shown for the Mississippi River, \$11 per ton in 1916 and \$4 in 1906. This small average was due to the fact that the combined tonnage of towing

vessels and unrigged craft formed a much larger proportion of the total in this division than in any other, the average earnings per ton of such craft being low when compared with those of freight and passenger vessels. Treating the freight and passenger vessels separately, there was a high average for both census years in earnings on their tonnage value for the Mississippi River, \$109 in 1916 and \$106 in 1906, and also of "all other craft," \$101 and \$75, respectively.

EMPLOYEES AND SALARIES AND WAGES.

The inquiries concerning employees and wages were substantially the same at the censuses of 1906 and 1916. The average number reported as employed on vessels was the number ordinarily required for their

operation, and the land force reported included persons employed in connection with the loading or discharging of cargoes and in their care, and in working about the warehouses, etc. No distinction was made between the officers and the crew on vessels, as it was found impracticable to segregate the salaries and wages for the different classes. An unsuccessful effort was made in 1906 to secure separately the allowance, if any, for board and lodging. In view of this failure amounts shown for this expense for that census were included with salaries and wages. In 1916 the same course was followed.

Table 44 shows the number and salaries and wages of the different classes of employees, by divisions, for 1916 and 1906.

TABLE 44.—EMPLOYEES, AND SALARIES AND WAGES, BY DIVISIONS, WITH PER CENT OF INCREASE: 1916 AND 1906.

DIVISION.	Census year.	TOTAL.		ON VESSELS.		ON LAND.					
		Number of employees.	Salaries and wages.	Number of employees.	Wages.	Total.		Officers, managers, clerks, etc.		All other.	
						Average number of employees.	Salaries and wages.	Average number of employees.	Salaries.	Average number of employees.	Wages.
Total.....	1916	236,882	\$140,859,932	153,301	\$103,235,534	83,581	\$37,624,398	18,867	\$16,299,779	64,714	\$21,324,619
	1906	188,348	103,092,712	140,929	71,636,521	47,419	31,456,191	13,464	12,276,420	33,955	19,179,771
Per cent of increase.....		25.8	36.6	8.8	44.1	76.3	19.6	40.1	32.8	90.6	11.2
Atlantic coast and Gulf of Mexico.....	1916	152,561	84,957,552	84,978	58,902,964	67,583	26,054,588	13,235	10,987,830	54,348	15,066,758
	1906	109,985	59,125,132	77,124	38,352,259	32,861	20,772,873	8,800	7,865,181	24,361	12,907,692
Per cent of increase.....		38.7	43.7	10.2	53.6	105.7	25.4	55.7	39.7	123.1	16.7
Pacific coast (including Alaska).....	1916	32,046	24,350,064	23,576	18,055,141	8,470	6,294,923	2,592	2,410,693	5,878	3,884,230
	1906	25,519	17,190,022	20,142	12,950,399	5,377	4,239,623	1,853	1,768,849	3,524	2,470,774
Per cent of increase.....		25.6	41.7	17.0	39.4	57.5	48.5	39.9	36.3	66.8	57.2
Great Lakes and St. Lawrence River.....	1916	31,923	22,628,228	26,873	18,633,219	6,050	3,995,009	2,073	2,174,341	2,977	1,820,668
	1906	31,253	18,170,296	24,916	13,280,716	6,337	4,889,580	1,974	1,874,357	4,363	3,015,223
Per cent of increase ¹		2.1	24.5	7.9	40.3	-20.3	-18.3	5.0	16.0	-31.8	-39.6
Mississippi River and its tributaries.....	1916	16,678	7,449,710	14,706	6,380,325	1,972	1,069,385	769	596,649	1,203	472,736
	1906	17,473	7,063,776	15,016	5,692,117	2,457	1,371,659	1,011	686,536	1,446	685,123
Per cent of increase ¹		-4.5	5.5	-2.1	12.1	-19.7	-22.0	-23.9	-13.1	-16.8	-31.0
Canals and other inland waters of New York State.....	1916	1,656	674,220	1,490	590,788	166	83,432	74	50,015	92	33,417
	1906	2,710	1,020,715	2,472	920,260	238	100,455	92	54,695	146	45,760
Per cent of increase ¹		-38.9	-33.9	-39.7	-35.8	-30.3	-16.9	.....	-8.6	-37.0	-27.0
All other inland waters.....	1916	2,018	800,158	1,678	673,097	340	127,061	124	80,251	216	46,810
	1906	1,408	522,771	1,259	440,770	149	82,001	34	26,802	115	55,199
Per cent of increase ¹		43.3	53.1	33.3	62.7	128.2	55.0	.....	199.4	87.8	-15.2

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

The number of persons employed on both land and sea in connection with water transportation as reported for 1916 was 236,882, which is 48,534, or 25.8 per cent, more than were so employed in 1906. Of these, 153,301, or 64.7 per cent, were employed on vessels, being an increase of 12,372, or 8.8 per cent, over the number reported in 1906. The number employed on land, 83,581, an increase of 36,162, or 76.3 per cent, over those serving in like capacities in 1906, were separated into "Officers, managers, clerks, etc." and "All other," these classes in 1916 forming 22.6 and 77.4 per cent of the total, respectively, as compared with 28.4 and 71.6 per cent in 1906.

Nearly two-thirds of the total employees in 1916 were reported from the Atlantic coast and Gulf of Mexico division, an increase of nearly two-fifths since

1906. Also the number employed on vessels in this division constituted considerably over one-half of the number reported for the United States, a gain of 10.2 per cent for the decade. The Pacific coast and the Great Lakes divisions, second and third, respectively, were nearly equal in respect to the total employed on both land and sea for 1916, but the increase during the decade for the former division, 25.6 per cent, was much greater than that for the latter, 2.1 per cent. The number employed on vessels operating on the Great Lakes, however, was considerably larger than the number shown for the Pacific coast, although the increase was but 7.9 per cent as compared with 17 per cent for the Pacific coast. The slight net gain in the total number of employees in the Great Lakes division was due to the loss of 20.3 per cent in number

employed on land, which decrease was wholly in the "All other" class. The division of the Mississippi River and its tributaries shows a decrease during the decade of 4.5 per cent in the total number employed, the loss being much greater relatively in the number employed on land than on vessels. There were decreases throughout in the number employed on "Canals and other inland waters of New York state" and substantial increases in employees on "All other inland waters."

The relative increase in the wages of employees on vessels was much larger than that in the salaries and wages of employees on land, 44.1 per cent for the former compared with 19.6 per cent for the latter. The wages of the men aboard ship constituted 73.3 per cent of the total salaries and wages in 1916 and 69.5 per cent in 1906.

Both the greatest absolute and the greatest relative increase in total wages paid to men aboard ship, \$20,550,705, or 53.6 per cent, are shown for the Atlantic coast and Gulf of Mexico division. The next greatest absolute gain, \$5,352,503, was in the division of the Great Lakes and St. Lawrence River, but second rank in relative gain, 52.7 per cent, was in "All other inland waters," which division, however, contributed less than 1 per cent of the total for all divisions.

Notwithstanding a slight reduction in number of employees on vessels in the division of the Mississippi River and its tributaries, the wages increased 12.1 per cent. There was a general reduction in this division in both the number and the salaries and wages of all kinds of land employees.

FREIGHT.

As this report includes statistics for American-owned vessels only, the figures for freight transported and income from same do not represent the total traffic of American ports, but relate only to freight carried on American vessels with the income reported from such source.

The true relation of freight and income can not be determined without complete information in regard to the distances the freight was carried, the character of the commodities, the kind of vessels, etc. An effort was made at the census of 1906 to secure the number of miles sailed by each vessel during the year, but the results were so unsatisfactory that the inquiry was abandoned at that census, and in 1916 no attempt was made to secure such information.

Table 45 shows the total freight and lighterage or harbor work, and corresponding income, by divisions, at the census of 1916.

TABLE 45.—FREIGHT TRANSPORTED AND LIGHTERAGE OR HARBOR WORK, WITH INCOME FROM SAME, BY DIVISIONS: 1916.

DIVISION.	TOTAL.				FREIGHT.				LIGHTERAGE OR HARBOR WORK.			
	Tons (2,000 pounds).	Per cent of total.	Income.	Per cent of total.	Tons (2,000 pounds).	Per cent of total.	Income.	Per cent of total.	Tons (2,000 pounds).	Per cent of total.	Income.	Per cent of total.
Total.....	381,432,974	100.0	\$434,604,705	100.0	258,082,659	100.0	\$386,536,641	100.0	123,350,315	100.0	\$48,068,064	100.0
Atlantic coast and Gulf of Mexico.....	181,602,844	47.6	¹ 295,899,192	68.1	80,335,771	31.1	252,982,693	65.4	101,267,073	82.1	42,916,499	89.3
Pacific coast (including Alaska).....	25,127,633	6.6	¹ 56,813,446	13.1	21,856,134	8.5	55,613,795	14.4	3,271,499	2.7	1,199,651	2.5
Great Lakes and St. Lawrence River.....	131,473,591	34.5	72,313,283	16.6	125,385,545	48.6	70,382,512	18.2	6,088,046	4.9	² 1,930,771	4.0
Mississippi River and its tributaries.....	40,169,427	10.5	7,563,446	1.7	27,962,583	10.8	5,671,446	1.5	12,206,844	9.9	² 1,892,000	3.9
All other inland waters.....	3,059,479	0.8	2,015,338	0.5	2,542,626	1.0	1,886,195	0.5	516,853	0.4	³ 129,143	0.3

¹ Includes \$7,611,503 reported as income from "all other sources" by tugboats in the Atlantic coast and Gulf of Mexico division, and \$235,991 similarly reported by such boats in the Pacific coast division. This income, although shown under "all other sources" (that is, for towing) was found to have been for lighterage or harbor work, and is, therefore, so shown in this table. It is not included as income from lighterage in any other table of the report.

² Reported as income received from "all other sources."

³ Includes \$11,149 reported as income from "all other sources."

The total quantity of freight handled as reported in Table 45 includes 258,082,659 tons transported from one port to another and 123,350,315 tons of lighterage or work within and about harbors. Of the total, about two-thirds was port to port freight, while of the total income, this class reported almost nine-tenths. In all divisions except the Atlantic coast

and Gulf of Mexico the proportion of freight transported from port to port was much greater than that of freight handled within the harbors. The preponderance of harbor freight in the Atlantic coast division may be accounted for largely by the enormous barge traffic at the port of New York.

The figures in Table 45 also show that the proportions contributed by the different divisions to the total quantity of freight and the total income were very different. The Atlantic coast contributed 47.6 per cent of the total quantity of freight and 68.1 per cent of the total income and the Pacific coast 6.6 per cent of the total quantity of freight and 13.1 per cent of the total income. On the other hand, the proportions for the Great Lakes and Mississippi River were reversed, the amount of freight forming a much larger proportion of the total than the income, the former division contributing 34.5 per cent of the total quantity of freight and 16.6 per cent of the total income, and the latter division 10.5 per cent of the freight handled and 1.7 per cent of the income. This indicates that the average haul was longer and the work generally more costly on the Atlantic and Pacific

coasts than on the Great Lakes and the Mississippi River. On the Great Lakes the bulky commodities, iron ore and coal, formed more than eight-tenths of the total quantity of freight handled, while on the Mississippi River coal alone formed about one-half of the total freight handled. The income per ton for freight handled is significant of the distances and classes carried. Based upon the totals in Table 45, the income for the several divisions per ton of freight, and, as a matter of information, for lighterage also were as follows:

DIVISION.	Freight.	Lighterage.
Atlantic coast and Gulf of Mexico.....	\$3.15	\$0.42
Pacific coast (including Alaska).....	2.54	0.37
Great Lakes and St. Lawrence River.....	0.56	0.32
Mississippi River and its tributaries.....	0.20	0.15
All other inland waters.....	0.74	0.25

DIAGRAM 7.—FREIGHT TRANSPORTED AND LIGHTERAGE OR HARBOR WORK. BY DIVISIONS: 1916.

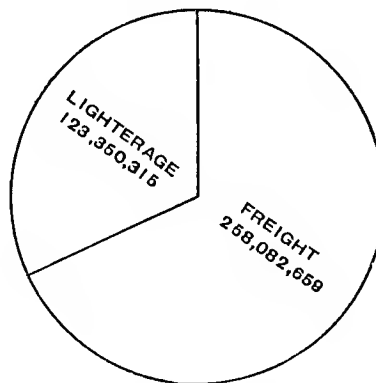
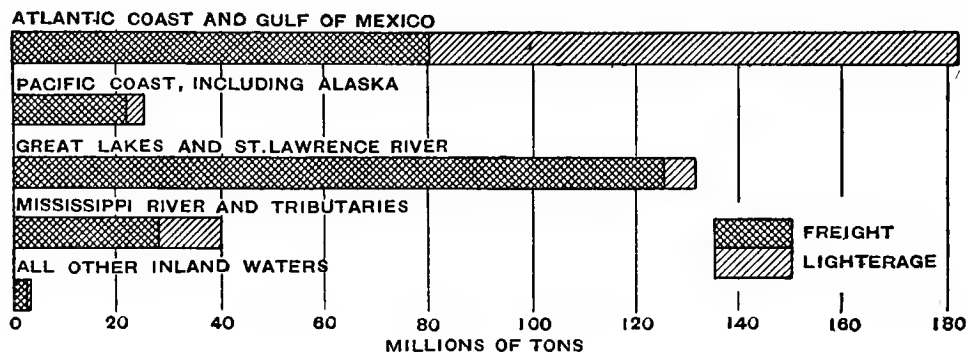


Table 46 shows the quantities of the principal articles of freight shipped, by commodities and divisions, 1916.

Based upon the number of tons of freight moved, iron ore was the most important commodity trans-

ported on the waters of the United States in 1916, constituting 28.5 per cent of all freight in that year. Practically the whole of this iron ore was reported by the Great Lakes division, less than 2 per cent being reported by all the other divisions combined.

TABLE 46.—FREIGHT SHIPPED, BY COMMODITIES AND BY DIVISIONS: 1916.

COMMODITY.	Total.	Atlantic coast and Gulf of Mexico.	Pacific coast (including Alaska.)	Great Lakes and St. Law- rence River.	Mississippi River and its tributaries.	All other inland waters.
Total..... tons ¹	* 258,002,611	80,259,375	21,853,985	125,384,042	27,962,583	2,542,626
Canned goods..... tons.....	951,790	535,372	326,007	14,951	72,820	2,640
Cement, brick, and lime..... tons.....	2,951,828	2,350,779	208,358	199,913	175,724	17,054
Coal..... tons.....	68,548,575	23,248,105	270,649	30,179,847	13,916,013	933,901
Cotton..... tons.....	927,039	741,400	4,990	46	180,553	40
Flour..... tons.....	1,718,462	232,127	298,629	1,085,290	99,513	2,908
Fruits and vegetables..... tons.....	2,348,508	1,613,586	481,600	117,906	119,297	11,119
Grain..... tons.....	5,076,313	862,378	546,042	5,969,521	617,946	80,426
Ice..... tons.....	1,032,966	941,648	878	5,995	14,302	70,243
Iron ore..... tons.....	73,487,237	344,968	10,228	72,614,761	470,499	16,271
Lumber..... (M feet).....	11,606,735	5,330,616	3,184,755	1,629,756	744,873	166,405
Naval stores..... tons.....	(6,533,244)	(2,938,023)	(1,996,750)	(1,091,898)	(344,208)	(112,189)
Petroleum and other oils..... (bbls.).....	18,619,925	10,358,849	7,699,115	314,959	245,930	1,072
Phosphate and fertilizer..... tons.....	(109,147,709)	(58,970,191)	(46,656,072)	(1,962,150)	(1,553,878)	(5,418)
Pig iron and steel rails..... tons.....	1,385,356	1,279,937	33,680	68,458	2,281	3,281
Stone, sand, etc..... tons.....	1,326,986	718,734	142,776	184,188	255,615	25,673
Tobacco..... tons.....	15,478,563	6,718,929	1,638,685	7,506,452	1,710,857	903,640
Miscellaneous merchandise..... tons.....	227,403	140,226	8,188	3,584	75,393	12
	45,896,465	23,875,061	6,983,111	5,556,967	9,176,355	304,971

¹ All tons of 2,000 pounds.

² Does not include 80,048 tons of freight carried on fishing vessels.

Coal, the second commodity in rank by tonnage moved, formed 26.6 per cent of the total for all commodities carried in 1916. Coal traffic also was greatest on the Great Lakes, 44 per cent of the total being reported for that division. The Atlantic coast division was second in tonnage of coal shipped, with 33.9 per cent, and the Mississippi River was third, with 20.3 per cent, of the total. Less than 2 per cent was reported by the two remaining divisions combined. "Miscellaneous merchandise" embraced a variety of articles, and was third in number of tons transported in 1916, more than half of which was reported from the Atlantic coast division.

Building materials—stone, brick, lime, cement, etc.—formed the next most important class of freight transported. Large quantities of these materials were shipped by water in all the different divisions, the movement not being noticeably localized.

The transportation of petroleum, crude and refined, and other oils was confined almost entirely to the Atlantic and Pacific coasts, these two divisions reporting, respectively, 55.6 and 41.3 per cent of all oil shipped in 1916.

Freight activities of leading ports.—Table 47 shows the shipments and receipts of freight for the principal ports in the United States in 1916.

It must be remembered that the figures in Table 47 show the activity of freight movements by American vessels and is exclusive of freight carried in vessels of foreign ownership. On the Atlantic and Pacific

coasts, where a large part of the freight movement is in foreign bottoms, the combined totals would be much greater, and those for the Great Lakes ports somewhat larger than the figures given in the present table. The shipments and receipts, therefore, as shown in this table, are somewhat misleading, particularly for some of the cities on the Atlantic coast, which, by reason of their large population, great manufacturing industries, and advantageous positions, are great distributing centers for ocean freight. For instance, the port of New York, with its millions of inhabitants and its recognized position as the greatest port in the United States, shows in this table less than one-half the total freight reported for Duluth and Superior, which two cities combined have less than 200,000 population. Duluth and Superior are situated at the headwaters of Lake Superior in close contact with the iron ore ranges of that section, and this commodity formed 92.7 per cent of their total shipments. The shipments from these two ports far outweighed the receipts, being almost four times as great.

Of the 116 ports in the table, 33 are situated on the Atlantic and Gulf coasts, 46 on the Great Lakes, 30 on the Mississippi River and its tributaries, and 7 on the Pacific coast. That a greater number of the ports shown in the table belong to the Great Lakes than to any other district is due largely to the number of ports, little and big, found necessary and convenient in Michigan, Minnesota, and Wisconsin for the receipt of iron ore from the great ranges of the Lake Superior district.

TABLE 47.—TOTAL SHIPMENTS AND RECEIPTS FOR THE PRINCIPAL PORTS IN THE UNITED STATES: 1916.

PORT.	Total.	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).	PORT.	Total.	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).
Albany, N. Y.	444, 102	181, 059	263, 043	Manistee, Mich.	82, 297	51, 923	30, 374
Alpena, Mich.	1, 862, 186	1, 237, 944	624, 242	Manistiquie, Mich.	593, 067	356, 517	236, 550
Ashtabula, Wis.	10, 030, 144	9, 256, 271	773, 873	Manitowoc, Wis.	1, 809, 263	788, 892	1, 020, 371
Ashtabula, Ohio	17, 429, 436	4, 521, 184	12, 908, 252	Marietta, Ohio	23, 491	16, 043	13, 448
Baltimore, Md.	7, 066, 962	3, 297, 205	3, 769, 757	Marine City, Mich.	100, 482	52, 526	47, 956
Bangor, Me.	387, 660	32, 128	355, 532	Marquette, Mich.	4, 712, 482	4, 341, 874	370, 608
Baton Rouge, La.	12, 086, 786	11, 024, 820	11, 061, 966	Memphis, Tenn.	287, 047	80, 419	206, 628
Beaufort, N. C.	17, 378	3, 437	13, 941	Menominee, Mich.	425, 242	181, 523	243, 719
Boston, Mass.	10, 986, 591	1, 049, 954	9, 936, 637	Milwaukee, Wis.	7, 929, 084	1, 203, 257	6, 725, 827
Bowling Green, Ky.	39, 541	4, 846	34, 695	Mobile, Ala.	596, 286	349, 632	246, 054
Bridgeport, Conn.	1, 300, 372	117, 720	1, 182, 652	Moline, Ill.	58, 363	301	58, 062
Brunswick, Ga.	218, 205	162, 175	56, 030	Muscatine, Iowa.	36, 054	3, 119	32, 935
Buffalo, N. Y.	19, 473, 895	3, 589, 778	15, 884, 117	Muskegon, Mich.	87, 291	25, 151	62, 140
Burlington, Iowa	50, 201	7, 500	42, 701	Nashville, Tenn.	39, 291	16, 981	39, 270
Burnside, Ky.	25, 301	12, 653	12, 648	Natchez, Miss.	177, 657	132, 282	145, 375
Cairo, Ill.	66, 886	12, 910	53, 976	New Bedford, Mass.	960, 917	205, 302	755, 615
Calcutta, Mich.	3, 199, 960	3, 194, 144	5, 816	New Haven, Conn.	2, 153, 644	451, 408	1, 702, 236
Charleston, S. C.	742, 564	373, 898	368, 066	New London, Conn.	1, 031, 686	250, 016	781, 670
Charleston, W. Va.	74, 581	39, 423	35, 158	New Orleans, La.	15, 773, 555	12, 635, 596	13, 137, 959
Charlotte, N. Y.	1, 012, 200	1, 012, 200	.....	New York, N. Y.	23, 092, 675	9, 641, 927	13, 450, 748
Chattanooga, Tenn.	51, 780	21, 348	30, 412	Norfolk and Newport News, Va.	17, 132, 777	13, 886, 853	3, 245, 924
Cheboygan, Mich.	32, 424	7, 106	25, 318	Ogdensburg, N. Y.	360, 422	10, 594	349, 828
Chicago, Ill.	14, 588, 719	1, 307, 438	13, 281, 281	Oswego, N. Y.	648, 858	582, 896	65, 962
Cincinnati, Ohio.	1, 411, 149	158, 410	1, 252, 739	Paducah, Ky.	1784, 552	1325, 643	1423, 909
Cleveland, Ohio.	16, 402, 987	2, 946, 735	13, 456, 252	Parkersburg, W. Va.	60, 848	36, 224	24, 624
Clinton, Iowa.	37, 127	1, 325	35, 802	Pekin, Ill.	42, 423	300	42, 123
Conneaut, Ohio.	12, 563, 823	1, 443, 060	11, 120, 763	Pensacola, Fla.	178, 118	99, 012	79, 106
Davenport, Iowa.	99, 667	6, 022	94, 645	Philadelphia, Pa.	7, 702, 287	4, 228, 486	3, 473, 771
Decatur, Ala.	37, 851	8, 595	29, 256	Pine Bluff, Ark.	25, 655	2, 975	22, 680
Detour, Mich.	641, 695	245, 099	396, 596	Pittsburgh, Pa.	6, 727, 229	238, 296	6, 488, 933
Detroit, Mich.	1, 740, 385	280, 777	1, 459, 608	Port Arthur, Tex.	2, 639, 017	1, 882, 277	756, 740
Duluth, Minn., and Superior, Wis.	52, 787, 525	42, 082, 083	10, 705, 442	Port Huron, Mich.	212, 130	36, 234	175, 896
Erie, Pa.	3, 927, 580	1, 728, 024	2, 199, 556	Portland, Oreg.	1, 399, 426	507, 254	892, 172
Escanaba, Mich.	8, 477, 762	7, 992, 317	485, 445	Portland, Me.	1, 749, 469	220, 579	1, 528, 890
Evansville, Ind.	251, 549	56, 210	195, 339	Portsmouth, N. H.	245, 093	20, 777	224, 316
Fairport, Ohio.	3, 947, 084	514, 058	3, 433, 026	Providence, R. I.	4, 398, 953	462, 239	3, 936, 714
Fall River, Mass.	1, 027, 328	387, 679	639, 649	Racine, Wis.	130, 516	28, 263	102, 253
Frankfort, Mich.	1, 947, 790	846, 686	1, 100, 804	Rockland, Me.	280, 032	86, 693	193, 339
Galveston, Tex.	2, 175, 181	1, 276, 995	898, 186	Sacramento, Calif.	191, 939	31, 020	160, 919
Gary, Ind.	2, 956, 464	.....	2, 956, 464	St. Louis, Mo.	154, 813	44, 104	110, 709
Gladstone, Mich.	76, 511	2, 191	74, 320	Sandusky, Ohio.	2, 951, 843	2, 599, 216	352, 627
Grand Haven, Mich.	717, 201	276, 377	440, 824	San Francisco, Calif.	6, 519, 660	2, 302, 021	4, 217, 639
Green Bay, Wis.	623, 287	10, 394	612, 893	Sault Ste. Marie, Mich.	1, 413, 046	30, 381	1, 382, 665
Greenville, Miss.	61, 564	11, 233	50, 331	Savannah, Ga.	1, 048, 719	584, 914	463, 805
Gulport, Miss.	273, 747	160, 677	113, 070	Seattle, Wash.	2, 836, 736	1, 184, 343	1, 652, 393
Hancock and Houghton, Mich.	1, 306, 215	105, 147	1, 201, 068	Sheboygan, Wis.	654, 832	11, 927	642, 905
Helena, Ark.	342, 213	173, 112	169, 101	Stockton, Calif.	422, 668	119, 964	302, 704
Huron, Ohio.	2, 440, 934	1, 004, 165	1, 436, 769	Tacoma, Wash.	872, 190	341, 701	530, 489
Indiana Harbor, Ind.	1, 739, 661	159, 930	1, 579, 731	Tampa and Port Tampa City, Fla.	799, 137	358, 785	440, 352
Jacksonville, Fla.	1, 495, 240	839, 356	655, 884	Toledo, Ohio.	9, 157, 292	6, 812, 923	2, 344, 369
Jersey City, N. J.	104, 427	73, 687	30, 740	Tonawanda Harbor, N. Y.	399, 059	.....	399, 059
Keweenaw, Wis.	331, 607	180, 073	151, 534	Two Harbors, Minn.	12, 189, 260	11, 892, 074	297, 186
Key West, Fla.	445, 963	283, 746	162, 217	Vicksburg, Miss.	1778, 148	214, 769	1563, 379
Lorain, Ohio.	8, 384, 656	3, 134, 241	5, 250, 415	Washburn, Wis.	211, 779	30, 352	180, 827
Los Angeles, Calif.	66, 436	5, 520	60, 906	Washington, D. C.	1, 048, 583	61, 898	986, 685
Louisville, Ky.	369, 614	108, 927	260, 687	Wheeling, W. Va.	28, 296	9, 354	18, 942
Ludington, Mich.	1, 662, 143	961, 607	700, 536	Wilmington, Del.	304, 011	60, 992	243, 019
Madison, Ind.	135, 382	52, 838	82, 544	Wilmington, N. C.	162, 166	74, 812	87, 354

1 Includes railway car freight.

Those ports situated on the Atlantic and Gulf coasts have an aggregate estimated population of over 11,000,000 with shipments and receipts totaling nearly 98,000,000 net tons. The ports shown for the Great Lakes have about one-half the population of the Atlantic and Gulf coast ports, yet report over twice the amount of freight.

Of the 10 ports leading in total shipments and receipts by American vessels, the combined port of Duluth-Superior is first by a very wide margin, and New York second, the others following in the order named: Buffalo, Ashtabula, Norfolk-Newport News, Cleveland, Chicago, Conneaut, Two Harbors, and Boston. All but 3 of these 10 ports belong to the Great Lakes division.

Harbor work or lighterage is not included in Tables 46 and 47, but is presented, by geographic divisions, in Table 48 for 1916 and 1906.

TABLE 48.—NUMBER OF TONS CARRIED BY VESSELS ENGAGED IN LIGHTERAGE OR HARBOR WORK, BY DIVISIONS: 1916 AND 1906.

DIVISION.	TONS (2,000 POUNDS).	
	1916	1906
Total.....	123, 350, 315	188, 026, 046
Atlantic coast and Gulf of Mexico.....	101, 267, 073	75, 151, 085
Pacific coast (including Alaska).....	3, 271, 499	4, 321, 523
Great Lakes and St. Lawrence River.....	6, 088, 046	(2)
Mississippi River and its tributaries.....	12, 206, 844	8, 325, 548
All other inland waters.....	516, 853	227, 890

1 Exclusive of harbor freight on the Great Lakes. 2 Figures not available.

In both 1906 and 1916 the Atlantic coast and Gulf of Mexico division reported the greatest harbor tonnage moved, amounting to 82.1 per cent of the total for the United States in 1916. This harbor work represented largely operations in New York Harbor. The absolute increase was greatest for this division, but in relative gain the division of "All other inland waters" was ahead, with 126.8 per cent. The increase in lighterage in the division of the Mississippi River and its tributaries is notable, 3,881,296 tons, or 46.6 per cent. The harbor work of the Pacific coast (including Alaska) decreased 24.3 per cent.

The value of the foreign trade of the United States is shown in Table 49, covering the census years 1916, 1906, and 1889, and each intervening year.

TABLE 49.—VALUE OF THE FOREIGN TRADE OF THE UNITED STATES IN AMERICAN AND FOREIGN VESSELS: 1889 TO 1916.¹

YEAR ENDING JUNE 30—	Total.	In American vessels.	In foreign vessels.	Per cent in American vessels.
1889.....	\$1,420,868,649	\$203,805,108	\$1,217,063,541	14.3
1890.....	1,573,567,830	202,451,086	1,371,116,744	12.9
1891.....	1,656,540,812	206,459,725	1,450,081,087	12.5
1892.....	1,784,733,386	220,173,735	1,564,559,651	12.3
1893.....	1,626,082,075	197,765,507	1,428,316,568	12.2
1894.....	1,468,290,672	195,268,216	1,273,022,456	13.3
1895.....	1,456,403,388	170,507,196	1,285,896,192	11.7
1896.....	1,565,665,408	187,691,887	1,377,973,521	12.0
1897.....	1,714,829,043	189,075,277	1,525,753,766	11.0
1898.....	1,743,820,496	161,328,017	1,582,492,479	9.3
1899.....	1,806,876,063	160,612,206	1,646,263,857	8.9
1900.....	2,089,528,616	195,084,192	1,894,444,424	9.3
1901.....	2,151,935,411	177,398,615	1,974,536,796	8.2
1902.....	2,104,849,301	185,819,987	1,919,029,314	8.8
1903.....	2,240,801,420	214,695,032	2,026,106,388	9.6
1904.....	2,230,938,633	229,735,119	2,001,203,514	10.3
1905.....	2,393,809,408	290,607,946	2,103,201,462	12.1
1906.....	2,690,014,559	322,347,205	2,367,667,354	12.0
1907.....	3,002,627,317	318,331,026	2,684,296,291	10.6
1908.....	2,793,253,186	272,513,322	2,520,739,864	9.8
1909.....	2,721,351,031	258,657,217	2,462,693,814	9.5
1910.....	2,982,799,622	260,837,147	2,721,962,475	8.7
1911.....	3,210,642,970	280,206,464	2,930,436,506	8.7
1912.....	3,431,470,423	322,451,565	3,109,018,858	9.4
1913.....	3,773,060,925	381,032,496	3,392,028,429	10.1
1914.....	3,785,468,512	368,359,756	3,417,108,756	9.7
1915.....	3,992,625,475	571,931,912	3,420,693,563	14.3
1916.....	5,826,041,211	948,908,216	4,877,132,995	16.3

¹ From the report of the Commissioner of Navigation, Department of Commerce, 1916, pp. 180 and 181.

The values in this table are divided between that of freight carried in American and that in foreign vessels. It is interesting to notice the gain in the proportion which the value of foreign trade carried in American vessels constituted of the total. During the 10 years following the census of 1906, this proportion increased from 12 per cent at that census to 16.3 in 1916. The actual increase in value was \$626,561,011, or 194.4 per cent, compared with a growth of \$2,509,-

465,641, or 106 per cent, in the value of freight carried in foreign vessels.

Table 50 shows the tonnage of American sail and steam vessels, exclusive of fishing vessels, in the foreign and in the coastwise trade for a series of years beginning with the census year 1889.

TABLE 50.—TONNAGE OF THE SAIL AND STEAM VESSELS OF THE MERCHANT MARINE OF THE UNITED STATES EMPLOYED IN THE FOREIGN AND COASTWISE TRADE, NOT INCLUDING FISHING VESSELS: 1889 TO 1916.¹

YEAR ENDING JUNE 30—	Total (tons).	Foreign (tons).	Coastwise (tons).
1889.....	4,211,035	999,619	3,211,416
1890.....	4,337,497	928,062	3,409,435
1891.....	4,598,595	988,719	3,609,876
1892.....	4,678,397	977,624	3,700,773
1893.....	4,737,892	883,199	3,854,693
1894.....	4,595,974	899,698	3,696,276
1895.....	4,551,061	822,347	3,728,714
1896.....	4,620,129	829,833	3,790,296
1897.....	4,639,696	792,570	3,896,526
1898.....	4,685,915	726,213	3,959,702
1899.....	4,802,542	837,229	3,965,313
1900.....	5,103,311	816,795	4,286,516
1901.....	5,462,240	879,595	4,582,645
1902.....	5,731,949	873,235	4,858,714
1903.....	6,020,301	879,264	5,141,037
1904.....	6,223,792	888,628	5,335,164
1905.....	6,385,438	943,750	5,441,688
1906.....	6,602,510	928,466	5,674,044
1907.....	6,872,067	861,466	6,010,601
1908.....	7,302,275	930,413	6,371,862
1909.....	7,329,565	878,523	6,451,042
1910.....	7,451,483	782,517	6,668,966
1911.....	7,583,808	863,495	6,720,313
1912.....	7,660,271	923,225	6,737,046
1913.....	7,836,145	1,019,165	6,816,980
1914.....	7,884,651	1,066,288	6,818,363
1915.....	8,349,098	1,862,714	6,486,384
1916.....	8,429,558	2,185,008	6,244,550

¹ From the report of the Commissioner of Navigation, Department of Commerce, 1916, p. 226.

These figures show the documented tonnage engaged in foreign trade, compared with that in the coastwise trade. Comparison with total census tonnage can not be made because the reports of the Commissioner of Navigation do not include "yachts; boats and lighters decked and not masted, employed within the harbor of any town or city; canal boats and barges without sails or internal motive power of their own, employed wholly upon canals or the internal waters of a state; barges and boats plying on rivers and lakes of the United States, and not engaged in trade with contiguous foreign territory, and not carrying passengers." ¹ Not including fishing vessels and vessels operating wholly or principally in Porto Rican and Hawaiian waters, but including yachts and many boats in the classes just named, the gross tonnage reported at the census of 1916 was 12,249,990.

¹ Report of Commissioner of Navigation, 1916, note preceding statistical tables, p. 191.

PASSENGERS.

Table 51 shows the number of passengers carried, by divisions, with per cent of increase, 1916 and 1906.

TABLE 51.—NUMBER OF PASSENGERS, BY DIVISIONS, WITH PER CENT OF INCREASE: 1916 AND 1906.

DIVISION AND CENSUS YEAR.	NUMBER OF PASSENGERS.		
	Total.	Ferry.	All other.
Total:			
1916.....	331,590,565	232,177,374	39,413,191
1906.....	306,825,663	330,737,639	36,088,024
Per cent of increase ¹	-9.6	-11.7	9.2
Atlantic coast and Gulf of Mexico:			
1916.....	237,345,627	218,045,127	19,300,500
1906.....	232,555,416	272,596,670	19,958,746
Per cent of increase.....	-18.9	-20.0	-3.3
Pacific coast (including Alaska):			
1916.....	55,408,843	48,280,569	7,128,274
1906.....	44,189,971	39,532,354	4,657,617
Per cent of increase.....	25.4	22.1	53.0
Great Lakes and St. Lawrence River:			
1916.....	19,231,681	13,290,770	5,940,911
1906.....	14,080,146	8,264,482	5,815,664
Per cent of increase.....	36.6	60.8	2.2
Mississippi River and its tributaries:			
1916.....	17,599,378	12,390,740	5,208,638
1906.....	14,122,241	10,022,612	4,099,629
Per cent of increase.....	24.6	23.6	27.1
All other inland waters:			
1916.....	2,005,036	170,168	1,834,868
1906.....	1,877,889	321,521	1,556,368
Per cent of increase ¹	6.8	-47.1	17.9

¹ A minus sign (—) denotes decrease.

Although the bulk of the earnings of freight and passenger vessels is from freight, a considerable proportion is derived from passenger service. In 1916 the income from passengers, as shown in Table 43, amounted to \$52,958,670, or 9.4 per cent of the gross earnings of all craft, as compared with \$43,645,365, or 14.8 per cent, in 1906. The increase during the decade was \$9,313,305, or 21.3 per cent.

Notwithstanding this increase in income, there was a decrease between 1906 and 1916 of 35,235,098, or 9.6 per cent, in the total number of passengers carried, due, as explained in the discussion of passengers under Table 1, to the construction and use of interurban bridges and tunnels, chiefly at New York. The loss was wholly in ferry passengers, since the number of passengers carried by boats, other than those devoted to ferriage, shows an increase of 3,325,167, or 9.2 per cent. The proportion which this class of passengers formed of the total also increased from 9.8 per cent in 1906 to 11.9 per cent in 1916. The greater part of this increase was reported from the Pacific coast division.

Although "All other inland waters" shows the largest percentage of decrease in number of ferry passengers, it was insignificant in actual loss as compared with that for the Atlantic coast, 151,353, as compared with 54,551,543 for the latter division.

As shown in Table 69, practically all the passengers reported were carried on steam passenger and ferry boats, only a small proportion, less than 1 per cent, being reported by vessels not engaged regularly in the passenger and freight business, such as tugboats, sailing vessels, unrigged craft, etc. The number carried

by these vessels altogether was 1,335,537, of which only 867 were reported as carried on sailing vessels.

The decline in total number of passengers carried during the decade is shown not only in the reports of the census but also in those of the United States Steamboat-Inspection Service. Table 52, prepared from that source, shows not only the totals for the United States but also for a number of the more important inspection districts for 1916 and 1906.

TABLE 52.—PASSENGERS REPORTED FOR THE PRINCIPAL DISTRICTS OF THE UNITED STATES STEAMBOAT-INSPECTION SERVICE: 1916 AND 1906.¹

LOCAL INSPECTION DISTRICT.	NUMBER OF PASSENGERS.		RANK.	
	1916	1906	1916	1906
Total.....	317,066,553	357,794,491	.....	.....
New York, N. Y.....	148,162,223	213,575,838	1	1
San Francisco, Calif.....	48,220,571	35,482,941	2	2
Philadelphia, Pa.....	38,635,337	32,228,234	3	3
Boston, Mass.....	21,148,103	17,665,329	4	4
Detroit, Mich.....	10,899,526	7,403,154	5	5
Norfolk, Va.....	5,307,189	5,964,799	7	6
New Orleans, La.....	5,985,276	4,030,718	6	7
Albany, N. Y.....	3,293,266	3,840,186	9	8
Baltimore, Md.....	2,619,786	3,702,873	10	9
Seattle, Wash.....	4,679,812	3,170,452	8	10
St. Louis, Mo.....	1,063,649	2,900,233	15	11
Providence, R. I.....	1,943,017	2,785,293	14	12
Portland, Me.....	1,945,453	2,372,900	13	13
Portland, Oreg.....	2,608,150	2,318,850	11	14
Chicago, Ill.....	639,495	1,818,194	20	15
Cincinnati, Ohio.....	1,981,279	1,649,038	12	16
Toledo, Ohio.....	1,013,554	1,565,056	16	17
New London, Conn.....	961,977	1,335,745	17	18
Point Pleasant, W. Va.....	821,842	1,297,152	19	19
Dubuque, Iowa.....	868,307	1,053,115	18	20
Duluth, Minn.....	290,405	1,051,074	21	21
All other districts.....	13,978,336	10,583,257	.....	.....

¹ Annual report of the Steamboat Inspector General, 1916, p. 22.

For comparative purposes this table shows the same districts in 1916 as in 1906, the districts shown for that year being those which reported 1,000,000 passengers or more. In 1916 three additional districts—Los Angeles, with 2,371,837 passengers; Buffalo, with 1,991,842; and Jacksonville, with 1,309,192—were added to the list of districts reporting as many as 1,000,000 passengers.

The total number of passengers reported by the Steamboat Inspector General as carried in 1916 was less by 40,727,938, or 11.4 per cent, than the number reported for 1906. More than half of the districts shown in Table 52 contributed to this decrease, the New York district being the principal locality of diminution, as shown also by census figures.

The census total of the number of passengers carried is considerably larger than that reported by the Steamboat-Inspection Service. This discrepancy of 14,524,012 between the two totals may be accounted for in part by the fact that different methods were followed in collecting the statistics, and that the figures for many vessels were necessarily estimates. The census also included smaller craft than those covered by the Inspection Service.

IDLE VESSELS.

As in the case of active craft, idle vessels are exclusive of those owned by the Federal Government and, except in Table 54, are exclusive also of those engaged in the fisheries. In view of what may appear to be a large tonnage shown for idle craft at a time when tonnage was in such demand, it should be explained that the totals for such craft were as reported by the owners. They include many vessels permanently withdrawn from active service, suitable only for sale as junk, vessels undergoing repairs, and new vessels delivered in 1916, but not placed in commission that year.

Table 53 shows the number and gross tonnage of idle vessels for 1916 and 1906.

TABLE 53.—NUMBER AND TONNAGE OF ACTIVE AND IDLE VESSELS, BY CLASS: 1916 AND 1906.

	Total.	Active.	Idle.
Total:			
Number—			
1916.....	40,575	37,894	2,681
1906.....	39,083	37,321	1,762
Gross tonnage—			
1916.....	12,613,240	12,249,990	363,250
1906.....	13,072,755	12,893,429	179,326
Steam:¹			
Number—			
1916.....	16,265	14,581	1,684
1906.....	10,757	9,927	830
Gross tonnage—			
1916.....	6,316,054	6,097,562	218,492
1906.....	4,159,418	4,059,521	99,897
Sail:			
Number—			
1916.....	3,309	3,002	307
1906.....	7,696	7,131	565
Gross tonnage—			
1916.....	1,201,746	1,171,174	30,572
1906.....	1,724,291	1,704,277	20,014
Unrigged:			
Number—			
1916.....	21,001	0,311	690
1906.....	20,630	20,263	367
Gross tonnage—			
1916.....	5,095,440	4,981,254	114,186
1906.....	7,189,046	7,129,631	59,415

¹ Includes craft propelled by machinery.

During the decade covered by Table 53 there was an increase of 919, or 52.2 per cent, in the number of idle vessels and 183,924, or 102.6 per cent, in their tonnage. The largest tonnage of idle craft at both censuses was for steam vessels, and the largest gain during the decade in such tonnage was also in this class. Idle sailing vessels decreased in number but increased in tonnage, while the unrigged increased in both factors from 1906 to 1916.

The great majority of the idle craft in 1916 were of less than 100 gross tons, the percentage being 80.6.

The idle tonnage, however, was preponderatingly with the vessels of over 100 gross tons, 84.7 per cent being so reported. Vessels classified as freight and passenger reported the greatest number and tonnage of idle craft, although a large part consisted of unrigged craft, barges, scows, lighters, etc. Ferryboats and craft of miscellaneous occupation, launches, pilot boats, etc., were least in number and tonnage of idle vessels.

TABLE 54.—NUMBER AND GROSS TONNAGE OF IDLE VESSELS, BY OCCUPATION: 1916.

OCCUPATION.	TOTAL.		OVER 100 TONS.		UNDER 100 TONS.	
	Number.	Gross tonnage.	Number.	Gross tonnage.	Number.	Gross tonnage.
Total.....	3,321	377,003	644	319,478	2,677	57,525
Freight and passenger.....	931	200,567	200	185,046	731	15,521
Tugs and other towing vessels..	319	14,117	24	5,651	295	8,466
Ferryboats.....	25	9,147	10	8,649	15	498
Fishing.....	640	13,753	25	5,610	615	8,143
Yachts.....	621	20,622	29	8,371	592	12,251
Miscellaneous.....	95	4,611	9	2,907	86	1,704
Unrigged (barges, etc.).....	690	114,186	347	103,244	343	10,942

In Table 55 idle vessels are shown, by divisions and tonnage groups, for 1916, exclusive of idle fishing craft.

The significance and importance of large and small idle tonnage are apparent from a study of the figures in this table. For instance, the two small tonnage groups, "5 to 49 tons" and "50 to 99 tons," contained 2,060 vessels, or 76.8 per cent of the total for all idle craft, but represented only 49,236 tons, or 13.6 per cent of the total. On the other hand, the larger craft, represented in the two groups, "500 to 999 tons" and "1,000 to 2,499 tons," while reporting 138 vessels, or only 5.1 per cent of the total number, represented 133,728 tons, or 36.8 per cent of the tonnage. By kinds of craft, those classed as steam led in the total for the United States, and in all groups but the four consecutive ones ranging from 100 to 499 tons, in which groups unrigged took precedence. Idle unrigged reached a high total in the group "500 to 999 tons," but showed nothing in the two largest groups of over 2,499 tons. In the largest tonnage group idle steam was the only class shown. In the largest group in which sailing vessels are shown, "2,500 to 4,999 tons," three vessels are reported, totaling 8,309 tons, for the Pacific coast and the Great Lakes divisions.

TABLE 55.—IDLE VESSELS, GROUPED ACCORDING TO GROSS TONNAGE, BY DIVISIONS: 1916.

DIVISION AND CLASS.	TOTAL.		5 TO 49 TONS.		50 TO 99 TONS.		100 TO 199 TONS.		200 TO 299 TONS.	
	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.
United States.....	2,681	363,250	1,790	30,245	270	13,991	234	32,735	119	29,582
Steam ¹	1,684	218,492	1,297	21,399	149	10,733	89	13,111	26	6,367
Sail.....	307	30,572	237	3,085	35	2,477	13	1,814	3	723
Unrigged.....	690	114,186	256	5,161	86	5,781	132	17,810	89	22,492
Atlantic coast and Gulf of Mexico.....	1,516	176,743	1,096	17,958	137	9,864	120	16,806	33	7,999
Steam.....	993	115,545	806	13,319	80	5,891	44	6,489	9	2,180
Sail.....	270	13,890	224	3,342	26	1,807	10	1,393	3	723
Unrigged.....	253	47,308	66	1,297	31	2,166	66	8,924	21	5,096
Pacific coast (including Alaska).....	452	81,430	300	5,169	35	2,524	36	5,212	15	3,679
Steam.....	277	61,916	177	2,672	20	1,510	25	3,051	8	1,958
Sail.....	13	5,328	5	167	4	285	11	1,561	7	1,721
Unrigged.....	162	14,186	118	2,330	11	729	11	1,561	7	1,721
Great Lakes and St. Lawrence River.....	288	61,738	158	3,033	37	2,519	21	3,223	25	5,922
Steam.....	175	28,612	130	2,352	18	1,191	8	1,325	5	1,265
Sail.....	23	11,344	7	166	5	385	3	421	1	1,265
Unrigged.....	90	21,782	21	515	14	943	10	1,477	20	4,657
Mississippi River and its tributaries.....	291	33,510	163	2,563	46	3,100	22	2,746	34	9,407
Steam.....	161	9,741	121	1,797	23	1,618	5	750	4	984
Unrigged.....	130	23,769	42	766	23	1,482	17	1,996	30	8,443
Canals and other inland waters of New York state.....	49	4,553	20	529	5	327	17	2,022	7	1,675
Steam.....	27	1,496	16	419	5	327	6	750	1	1,675
Sail.....	1	10	1	10	1	10	1	10	1	10
Unrigged.....	21	3,047	3	100	1	10	1	10	1	10
All other inland waters.....	85	5,276	53	993	10	657	18	2,726	4	900
Steam.....	51	1,182	47	840	3	196	1	146	1	146
Sail.....	34	4,094	6	153	7	461	17	2,580	4	900
Unrigged.....	34	4,094	6	153	7	461	17	2,580	4	900

DIVISION AND CLASS.	300 TO 399 TONS.		400 TO 499 TONS.		500 TO 999 TONS.		1,000 TO 2,499 TONS.		2,500 TO 4,999 TONS.		5,000 TONS AND OVER.	
	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.
United States.....	64	21,403	52	22,878	100	66,609	38	67,119	12	39,884	3	33,804
Steam ¹	17	5,985	17	7,595	48	33,437	29	54,486	9	31,575	3	33,804
Sail.....	2	712	3	1,390	8	5,827	3	5,635	3	8,309	1	1,265
Unrigged.....	45	14,706	32	13,893	44	27,345	6	6,998	1	1,265	1	1,265
Atlantic coast and Gulf of Mexico.....	42	13,872	27	11,995	31	18,930	19	34,658	9	31,575	2	13,086
Steam.....	10	3,557	6	2,790	12	8,306	15	28,352	9	31,575	2	13,086
Sail.....	1	323	2	972	2	1,424	2	3,906	1	1,265	1	1,265
Unrigged.....	31	9,992	19	8,233	17	9,200	2	2,400	1	1,265	1	1,265
Pacific coast (including Alaska).....	10	3,590	14	6,110	36	25,587	4	5,836	1	3,005	1	20,718
Steam.....	5	1,730	9	3,924	28	19,917	4	5,836	1	3,005	1	20,718
Sail.....	1	10	1	418	2	1,453	1	1,265	1	1,265	1	1,265
Unrigged.....	5	1,860	4	1,768	6	4,217	1	1,265	1	1,265	1	1,265
Great Lakes and St. Lawrence River.....	8	2,626	11	4,773	11	7,713	15	26,625	2	5,304	1	1,265
Steam.....	1	389	2	881	2	1,300	10	20,298	2	5,304	1	1,265
Sail.....	7	2,237	9	3,892	5	3,463	4	4,598	1	1,265	1	1,265
Unrigged.....	7	2,237	9	3,892	5	3,463	4	4,598	1	1,265	1	1,265
Mississippi River and its tributaries.....	4	1,315	22	14,379	6	3,914	16	10,465	1	1,265	1	1,265
Steam.....	2	698	6	3,914	16	10,465	1	1,265	1	1,265	1	1,265
Unrigged.....	2	617	16	10,465	1	1,265	1	1,265	1	1,265	1	1,265
Canals and other inland waters of New York state.....												
Steam.....												
Sail.....												
Unrigged.....												
All other inland waters.....												
Steam.....												
Sail.....												
Unrigged.....												

¹ Includes craft propelled by machinery.

Considering the total idle tonnage, by divisions, steam vessels led in the Atlantic coast, the Pacific coast, and the Great Lakes divisions. In the division of the Mississippi River and its tributaries, in "Canals and other inland waters of New York state," and in "All other inland waters" the unrigged tonnage prevailed. The idle steam tonnage predominated in most of the groups, but there were important exceptions. The unrigged led in five groups of the Atlantic coast and in one

of the Pacific coast. In five groups of the Great Lakes and St. Lawrence River division the unrigged tonnage was greatest. In the division of the Mississippi River and its tributaries unrigged tonnage excelled in all but three groups.

Table 56 shows the number and gross tonnage of enrolled and licensed vessels and of registered vessels, by steam and sail, from 1889 to 1916, inclusive.

TABLE 56.—NUMBER AND GROSS TONNAGE OF REGISTERED, ENROLLED, AND LICENSED SAIL AND STEAM VESSELS, CONSTITUTING THE TOTAL MERCHANT MARINE OF THE UNITED STATES, INCLUDING FISHING VESSELS: 1889 TO 1916.¹

YEAR.	TOTAL MERCHANT MARINE.							ENROLLED AND LICENSED VESSELS.			
	Total.		Annual increase in tonnage (per cent). ²	Steam. ³		Sail. ⁴		Total.		Annual increase in tonnage (per cent). ²	
	Number of vessels.	Gross tonnage.		Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.		
1916.....	26,444	8,469,649	1.0	15,061	6,070,063	10,383	2,399,586	23,310	6,277,934	-3.7	
1915.....	26,701	8,389,429	5.8	15,948	5,943,810	10,753	2,445,619	23,907	6,517,886	-4.9	
1914.....	26,943	7,928,688	0.5	15,491	5,427,526	11,452	2,501,162	24,538	6,852,536	-0.1	
1913.....	27,070	7,886,518	2.2	15,082	5,333,247	11,988	2,553,271	24,765	6,858,742	1.1	
1912.....	26,528	7,714,183	1.0	14,951	5,179,858	11,577	2,534,325	24,516	6,782,082	0.2	
1911.....	25,991	7,638,790	1.7	13,307	5,074,069	12,684	2,564,721	24,288	6,766,119	0.7	
1910.....	25,740	7,508,082	1.6	12,452	4,900,361	13,288	2,607,721	24,214	6,716,257	3.3	
1909.....	25,688	7,388,755	0.3	11,641	4,749,224	14,047	2,639,531	24,055	6,501,250	1.2	
1908.....	25,425	7,365,445	6.1	10,926	4,711,174	14,439	2,654,271	23,834	6,425,377	5.9	
1907.....	24,911	6,938,794	4.0	10,050	4,279,368	14,861	2,659,426	23,477	6,067,648	5.8	
1906.....	25,006	6,674,969	3.4	9,500	3,975,287	15,506	2,699,682	23,565	5,735,483	4.2	
1905.....	24,681	6,456,543	2.6	8,897	3,741,494	15,784	2,715,049	23,309	5,502,030	2.0	
1904.....	24,558	6,291,535	3.4	8,463	3,595,418	16,095	2,696,117	23,354	5,392,767	3.7	
1903.....	24,425	6,087,345	5.0	8,054	3,408,088	16,371	2,679,257	23,255	5,198,569	5.8	
1902.....	24,273	5,797,902	5.0	7,727	3,176,874	16,546	2,621,028	23,047	4,915,347	6.0	
1901.....	24,057	5,524,218	7.0	7,414	2,970,953	16,643	2,603,265	22,730	4,635,089	6.8	
1900.....	23,333	5,164,839	6.2	7,053	2,657,797	16,280	2,507,042	22,003	4,338,145	8.0	
1899.....	22,728	4,864,238	2.4	6,837	2,476,011	15,891	2,388,227	21,397	4,015,992	0.1	
1898.....	22,705	4,749,738	-0.4	6,712	2,371,923	15,993	2,377,815	21,569	4,012,029	1.2	
1897.....	22,633	4,709,020	1.4	6,599	2,358,558	16,034	2,410,462	21,403	3,963,436	2.7	
1896.....	22,908	4,703,880	1.5	6,595	2,307,208	16,313	2,396,672	21,651	3,858,926	1.6	
1895.....	23,240	4,635,960	-1.0	6,554	2,212,801	16,686	2,423,159	21,980	3,797,773	0.8	
1894.....	23,586	4,684,029	-2.9	6,526	2,189,430	17,060	2,494,599	22,236	3,767,849	-4.0	
1893.....	24,512	4,825,071	1.3	6,561	2,183,272	17,951	2,641,799	23,169	3,925,268	4.1	
1892.....	24,383	4,764,921	1.7	6,392	2,074,417	17,991	2,690,504	22,851	3,770,246	2.5	
1891.....	23,899	4,684,759	5.9	6,216	2,016,264	17,683	2,668,495	22,312	3,678,809	5.8	
1890.....	23,467	4,424,497	2.7	5,965	1,859,088	17,502	2,565,409	21,940	3,477,802	5.8	
1889.....	23,623	4,307,475	2.8	5,924	1,765,551	17,699	2,541,924	21,942	3,285,880	1.2	

YEAR.	ENROLLED AND LICENSED VESSELS.—contd.				REGISTERED VESSELS.							
	Steam. ³		Sail. ⁴		Total.		Annual increase in tonnage (per cent). ²	Steam. ³		Sail. ⁵		
	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.		Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	
1916.....	14,737	4,470,402	8,573	1,807,532	3,134	2,191,715	17.1	1,324	1,599,661	1,810	592,054	
1915.....	14,841	4,593,964	9,066	1,923,922	2,794	1,871,543	73.9	1,107	1,349,846	1,687	521,697	
1914.....	14,607	4,702,652	9,931	2,149,884	2,405	1,076,152	4.7	884	724,874	1,521	351,278	
1913.....	14,257	4,664,393	10,508	2,194,349	2,305	1,027,776	10.3	827	671,148	1,478	356,628	
1912.....	13,564	4,560,152	10,952	2,221,930	2,012	932,101	6.8	701	619,706	1,311	312,395	
1911.....	12,749	4,488,339	11,539	2,277,780	1,703	872,671	10.2	558	585,730	1,145	286,941	
1910.....	11,955	4,343,384	12,259	2,372,873	1,526	791,825	-10.8	497	556,977	1,029	234,848	
1909.....	11,143	4,170,698	12,912	2,330,552	1,633	887,505	-5.6	498	578,526	1,135	308,979	
1908.....	10,448	4,112,437	13,386	2,312,940	1,591	940,068	7.9	478	598,737	1,113	341,331	
1907.....	9,608	3,677,243	13,869	2,390,405	1,434	871,146	-7.3	442	602,125	992	269,021	
1906.....	9,094	3,384,002	14,471	2,351,481	1,441	939,486	-1.6	406	591,285	1,035	348,201	
1905.....	8,517	3,140,314	14,792	2,361,716	1,372	954,513	6.2	380	601,180	992	353,333	
1904.....	8,115	3,041,262	15,239	2,351,505	1,204	898,768	1.1	348	554,156	856	344,612	
1903.....	7,697	2,880,679	15,558	2,317,891	1,170	888,776	0.7	357	527,410	813	361,366	
1902.....	7,386	2,718,049	15,661	2,197,298	1,226	882,555	-0.7	341	458,825	885	423,730	
1901.....	7,059	2,491,231	15,671	2,143,858	1,327	889,129	7.6	355	429,722	972	459,407	
1900.....	6,715	2,316,455	15,288	2,021,690	1,330	826,694	-2.5	338	341,342	992	485,352	
1899.....	6,470	2,115,981	14,927	1,900,011	1,331	848,246	15.0	367	360,030	964	488,216	
1898.....	6,400	2,077,859	15,169	1,934,170	1,136	737,709	-8.4	312	294,064	824	443,645	
1897.....	6,352	2,100,084	15,051	1,863,352	1,230	805,584	-4.7	247	258,474	983	547,110	
1896.....	6,351	2,042,326	15,300	1,816,600	1,257	844,954	0.8	244	264,882	1,013	580,072	
1895.....	6,315	1,960,756	15,665	1,837,017	1,260	838,187	-8.5	239	252,045	1,021	586,142	
1894.....	6,280	1,923,339	15,956	1,844,510	1,350	916,180	1.8	246	266,091	1,104	650,089	
1893.....	6,312	1,922,169	16,857	2,003,099	1,343	899,803	-9.5	249	261,103	1,094	638,700	
1892.....	6,138	1,845,518	16,713	1,924,728	1,532	994,675	-1.1	254	228,899	1,278	765,776	
1891.....	5,945	1,776,269	16,367	1,902,540	1,587	1,005,950	6.3	271	239,995	1,316	765,955	
1890.....	5,732	1,661,458	16,208	1,816,344	1,527	946,695	-7.3	233	197,630	1,294	749,065	
1889.....	5,705	1,571,079	16,237	1,714,801	1,681	1,021,595	8.2	219	194,471	1,462	827,124	

¹ From the report of the Commissioner of Navigation, Department of Commerce, 1916, pp. 212 and 213.

³ Includes gasoline vessels since 1897.

⁴ Includes canal boats and barges.

² A minus sign (—) denotes decrease.

⁵ Includes barges.

The enrolled and licensed vessels are those engaged in the coastwise and inland waters trade, while those classed as registered are engaged primarily in foreign trade. In 1916, of the total merchant marine, therefore, 6,277,934 tons, or 74.1 per cent, were enrolled and licensed, and 2,191,715 tons, or 25.9 per cent, registered, as compared with 5,735,483 and 939,486 tons, or 85.9 per cent and 14.1 per cent, respectively, in 1906. Although the enrolled and licensed craft embraced much the larger tonnage at both of these censuses, the increase in tonnage for the registered vessels during the ten-year period was 1,252,229 tons, or 133.3 per cent, and for the enrolled, 542,451 tons, or 9.5 per cent, demonstrating a much greater actual and proportionate increase in the vessels engaged in foreign trade. The tonnage of steam vessels increased from 1,765,551 tons in 1889 to 6,070,063 tons in 1916, but those classed as sail in this table decreased from 2,541,924 tons to 2,399,586 tons during the same period.

In reference to foreign trade in American vessels, the following data from the census figures in 1916 are of interest:

In 1916 there were 1,139 vessels of 2,277,230 tonnage reported to the census as carrying freight to or from foreign ports during all, or a portion of the year. Of these vessels, 868, of 1,930,323 tonnage, operated on the Atlantic coast and the Gulf of Mexico, and 271, of 346,907 tonnage, on the Pacific coast (including Alaska). In addition 343 vessels, with a total tonnage of 1,101,327, carried freight to or from Canadian ports on the Great Lakes or St. Lawrence River, and 354, all unriggered and having a tonnage of 39,212, passed through Champlain Canal from Lake Champlain to Canada.

At the census of 1906 the number and tonnage of vessels reported to the Census Bureau to be in this foreign traffic, exclusive of the Great Lakes, were 660 and 886,830, respectively, and in addition 523 canal boats, of 55,034 tonnage, operated on the Champlain Canal and Lake Champlain and visited ports in Canada.

TRANSPORTATION BY WATER.

PORTO RICO AND HAWAII.

The statistics for American documented and undocumented vessels of 5 tons net register or over employed in the coastwise and foreign commerce of these islands are not included in the general totals for the United States, but are shown separately in Tables 57 and 58 for 1916 and 1906.

All floating equipment for both Porto Rico and Hawaii are included, as for the United States sections

of this report—that is, omitting vessels owned by the Federal Government, stationary wharf boats and house boats without power used chiefly for residence purposes. It should also be understood that the statistics for these islands were secured by mail, no special agents of the Census Bureau having visited the islands in connection with transportation by water at either census.

PORTO RICO.

An increase in the shipping interest of Porto Rico is shown for each of the three classes of vessels. With very few exceptions the vessels reported for Porto Rico in 1916 were engaged directly or indirectly in the freight and passenger business.

The figures for freight indicate an unusual condition, in that it was mostly harbor work at both censuses, and that the comparatively small quantity of freight, as distinguished from harbor work, was all carried in sail vessels in 1906 and largely so in 1916.

TABLE 57.—ALL VESSELS AND CRAFT, BY CLASSES: 1916 AND 1906.

	TOTAL.			STEAM.			SAIL.			UNRIGGED.		
	1916	1906	Per cent of increase.	1916 ¹	1906	Per cent of increase.	1916	1906	Per cent of increase. ²	1916	1906	Per cent of increase. ²
Number of vessels.....	320	205	56.1	19	4	.....	65	43	.....	236	158	49.4
Gross tonnage.....	11,943	\$5,566	114.6	968	94	.....	1,822	905	101.3	9,153	4,567	100.4
Value of vessels.....	\$607,708	\$180,519	236.6	\$155,850	\$29,200	433.7	\$143,122	\$43,175	231.5	\$308,736	\$108,144	185.5
Gross income.....	\$478,802	\$227,031	110.9	\$168,023	\$7,600	2,110.8	\$135,350	\$42,258	227.4	\$172,429	\$177,173	-2.7
Number employed on vessels.....	769	603	27.5	110	16	.....	203	132	53.8	456	455	0.2
Wages.....	\$211,608	\$121,533	74.1	\$55,630	\$5,381	933.8	\$55,366	\$24,861	122.7	\$100,612	\$91,291	10.2
Number of passengers carried.....	806,683	2,400	.....	805,135	.....	.....	1,548	2,400	-35.5	.....	.....	.....
Freight and harbor work (tons of 2,000 pounds).....	498,570	282,867	76.3	15,803	.....	.....	49,956	24,480	104.1	432,811	258,387	67.5
Freight carried.....	68,077	24,120	182.2	15,803	.....	.....	49,956	24,120	107.1	2,318	.....	.....
Harbor work.....	430,493	258,747	66.4	.....	.....	.....	.....	360	.....	430,493	258,387	66.6

¹ Includes 12 gasoline vessels of 337 tons in 1916. No boats of this class were reported in 1906.

² A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

The number of passengers increased from 2,400 in 1906 to 806,683 in 1916, due to the fact that two ferry-boats carrying 805,095 passengers in 1916 were not reported in 1906.

HAWAII.

Table 58 presents statistics for all American documented and undocumented vessels or craft of 5 tons net register or over, employed in the coastwise and foreign commerce of Hawaii, for 1916 and 1906.

TABLE 58.—ALL VESSELS AND CRAFT, BY CLASSES: 1916 AND 1906.

	TOTAL.			STEAM.			GASOLINE.			SAIL.			UNRIGGED.		
	1916	1906	Per cent of increase. ¹	1916	1906	Per cent of increase. ¹	1916	1906	Per cent of increase.	1916	1906	Per cent of increase.	1916	1906	Per cent of increase. ¹
Number of vessels.....	81	52	.....	19	23	.....	26	3	.....	7	10	.....	29	16	.....
Gross tonnage.....	17,807	10,682	66.7	10,750	8,802	22.1	670	26	.....	2,539	592	328.9	3,848	1,262	204.9
Value of vessels.....	\$1,887,728	\$1,204,100	56.8	\$1,435,640	\$1,127,500	27.3	\$232,877	\$14,750	1,478.8	\$153,200	\$16,900	806.5	\$86,011	\$44,950	46.9
Gross income.....	\$1,814,939	\$1,488,090	22.0	\$1,534,572	\$1,414,142	8.5	\$134,081	\$10,560	1,169.7	\$140,286	\$12,042	1,065.0	\$6,000	\$51,346	-88.3
Number employed on vessels.....	873	767	13.8	724	680	6.5	89	5	.....	48	43	.....	12	39	.....
Wages.....	\$545,059	\$428,679	27.1	\$445,534	\$398,635	11.8	\$59,171	\$2,580	2,193.4	\$33,924	\$9,044	275.1	\$6,430	\$18,420	-65.1
Number of passengers carried.....	271,865	75,614	-5.0	271,865	75,614	-5.0	.....	.....	.....	.....	.....	.....	.....	.....	.....
Freight and harbor work (tons of 2,000 pounds).....	804,671	413,447	94.6	452,365	378,165	19.6	32,107	.....	.....	25,172	9,006	179.5	295,027	26,276	1,022.8
Freight carried.....	583,769	380,811	53.3	452,365	373,755	21.0	32,107	.....	.....	25,172	7,056	256.7	74,125	26,276	740.7
Harbor work.....	220,902	32,636	576.9	.....	4,410	.....	.....	.....	.....	.....	1,950	.....	220,902	26,276	.....

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

² Department of Commerce, Steamboat-Inspection Service, Annual Report of Supervising Inspector General for fiscal year ending June 30, 1916, p. 34.

The comparative statistics presented for Hawaii are exclusive of fishing vessels for 1916, because such craft were not reported to the Census Bureau in 1906. There were, however, 12 fishing vessels reported in 1916 having a total of 154 tons, valued at \$22,200, which reported an income of \$55,334.

While the number of American steam and sail vessels operating in Hawaiian waters decreased, there were increases for such vessels in all other details except in the number of passengers carried on steam vessels. It is noticeable also that the proportionate increases for sailing vessels were much in excess of those for steam craft. The use of gasoline craft increased greatly during the 10 years in number, nearly eight fold, and in tonnage nearly twenty-five fold, their proportion of the total tonnage of all vessels having increased from two-tenths of 1 per cent in 1906 to 3.8 per cent in 1916.

A decided decrease appears in the income from the operations of unrigged craft during the 10 years, although the number, tonnage, value, and quantity of freight carried have largely increased. The decrease in income is due chiefly to the operation in 1906 of a large dredge which was not reported in 1916, and in part also to the difference in crediting receipts for freight carried to the towing craft instead of to the barge at the two censuses.

CANAL BOATS.

The classification of canal boats embraces such as are without power and are operated on canals. Steam canal boats, although operated on canals, are included with steam vessels and not with canal boats.

TABLE 59.—CANAL BOATS, BY DIVISIONS: 1916 AND 1906.

DIVISION AND CENSUS YEAR.	Number of boats.	Gross tonnage.	Value of boats.	Gross income.	Number of employees on boats.	Wages, including board.
Total:						
1916.....	1,501	198,120	\$2,202,752	\$2,202,440	1,417	\$538,569
1906.....	2,237	303,581	\$2,952,197	\$3,338,347	2,772	\$1,015,591
Per cent of increase ¹ ..	-32.9	-34.7	-25.4	-34.0	-48.9	-47.0
Atlantic coast and Gulf of Mexico: ²						
1916.....	445	63,730	\$914,437	\$617,159	360	\$206,519
1906.....	663	103,877	\$1,112,475	\$943,552	652	\$281,599
Per cent of increase ¹ ..	-32.9	-38.6	-17.8	-34.6	-44.8	-26.7
Great Lakes and St Lawrence River:						
1916.....	6	1,134	\$13,800	\$7,790	15	\$2,80
1906.....	2	323	\$4,100	\$12,500	8	\$2,000
Mississippi River and its tributaries:						
1916.....	651	84,696	\$974,095	\$1,093,554	618	\$223,401
1906.....	1,364	173,388	\$1,583,835	\$2,049,277	1,582	\$588,672
Per cent of increase ¹ ..	-52.3	-51.2	-38.5	-46.6	-60.9	-62.1
Canals and other inland waters of New York state:						
1916.....	405	49,694	\$314,220	\$491,727	439	\$108,649
1906.....	202	24,859	\$237,987	\$325,228	515	\$140,519
Per cent of increase ¹ ..	100.5	99.9	32.0	51.2	-14.8	-22.7
All other inland waters:						
1916.....	405	49,694	\$314,220	\$491,727	439	\$108,649
1906.....	202	24,859	\$237,987	\$325,228	515	\$140,519
Per cent of increase ¹ ..	100.5	99.9	32.0	51.2	-14.8	-22.7

¹ A minus sign (—) denotes decrease.

² Canal boats operated mostly in harbors, chiefly New York.

The statistics presented in Table 59 indicate that transportation on canals has not been fully utilized. Some of these canals may have been constructed without proper consideration to connecting links that would afford satisfactory transportation rates beyond its terminus, if desired. It is no doubt true that adequate terminals and facilities for handling freight are conspicuously absent. It would seem, therefore, in order that the country may secure the proper benefit from its canals, present and contemplated, that there should be a coordination of the entire canal system.

There was a large decrease during the 10 years in number and tonnage of canal boats, their value and gross income, and in number of employees and their wages. The decreases shown for the "Canals and other inland waters of New York state" account for most of the decreases in the United States. Much of this loss may be due to the change in the Erie Canal in New York state from a towpath canal to a canal on which steam and motor boats are used, which displaced, and in a measure rendered obsolete, the old style canal boat. The six canal boats reported for the Great Lakes and St. Lawrence River at the census of 1906 and the two shown for the Mississippi River and its tributaries at that census were not reported in 1916, thus leaving these divisions without representation in the latter year.

"All other inland waters" presents a conspicuous exception to the general losses shown for the other four divisions. Although there were decreases in this division in number of employees and in total wages paid, an increase is shown for these craft in all other particulars. The number of boats and their tonnage doubled, while their value increased nearly one-third and their gross income more than one-half.

The totals in Table 59 include, for the Atlantic coast division, canal boats engaged almost wholly in harbor work, which boats are omitted in the special section on canals. The tables for canal boats do not include such craft as scows, barges, lighters, etc.

Table 60 shows statistics for steam canal boats for 1916 and 1906.

TABLE 60.—STEAM VESSELS OPERATING ON CANALS: 1916 AND 1906.

	1916	1906	Per cent of increase. ¹
Number of vessels.....	97	84	15.5
Gross tonnage.....	5,751	7,280	-21.0
Value of vessels.....	\$393,772	\$418,800	-6.0
Gross income.....	\$311,273	\$370,101	-15.9
Number employed on vessels.....	310	362	-14.4
Wages.....	\$159,475	\$145,701	9.5
Freight carried (tons of 2,000 pounds).....	² 103,142	189,522	-45.6

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

² Includes 7,057 tons of lighterage.

The number of steam tugs, steam vessels, and steam canal boats operating for the most part on canals in-

creased during the 10 years from 84 to 97, but decreases are shown in all other particulars, except wages.

None of the steam vessels are included with canal boats shown in the general tables, but are classed according to service or occupation as freight and passenger, towing, or miscellaneous.

The increase in number of steam craft operating on canals is due in a measure to the completion and use of parts of the new barge-canal system of New York state. In this system there is no provision for towing canal boats by animal or other power from a towpath or adjacent lands. The canal boat, under the new arrangement, must either possess its own power or be towed by a tug. On a 25-mile section of new canal in Wayne county, New York, the state in 1916 provided two tugs for free service to boats entering the canal towed by horses from the old towpath, not yet wholly superseded.

Twenty-eight of the steam craft on canals in 1916 were strictly canal boats; of these, four were stern-wheelers; the others were equipped with screw propellers. All save one were classified by occupation as freight and passenger boats; the exception was a canal boat used for towing. Twenty-seven were reported operating on the canals of New York state; one, the tug, was on a western canal. Sixty-six of the 97 were vessels other than canal boats, and were used as freight and passenger vessels or as tugs.

The 3 additional steam craft, making the total of 97 shown in the table, operated for the most part in New York Harbor and on the Atlantic coast, and are therefore included in the totals for the Atlantic and Gulf coast division and not in those for "Canals and other inland waters of New York state" or in "All other inland waters." This explains the discrepancy between the total in Table 60 and the totals in the tables in the chapter on "Canals and other inland waters." These 3 steam canal boats had a tonnage of 379, a value of \$11,500, a gross income of \$9,265; employed 12 men at a total wage, including board and lodgings, of \$7,461, and carried 3,150 net tons of freight.

In addition to the 97 steam craft operating on canals in 1916, there were 18 motor boats, with a gross tonnage of 369, a horsepower of 692, a value of \$58,150, and a gross income of \$21,976. The number of employees on these craft was 18 and their wages, including board and lodgings, amounted to \$8,287. They reported freight carried to the amount of 2,300 net tons. New York state reported 11 of the motor boats, with a tonnage of 249, a horsepower of 542, a value of \$47,550, and a gross income of \$13,509. The number of employees was 10, and their wages, including board and lodging, were \$5,400. The freight carried amounted to 200 net tons. These figures, which are tabularly set forth under "Canals and other inland waters," disclose that 61.1 per cent of the motor craft operating on

canals were reported from the canals of New York state. They represented 67.5 per cent of the tonnage of such boats on canals and 81.8 per cent of the value, their income reaching 61.5 per cent of the total.

It is impracticable to segregate the number of steam and motor boats operating on canals in 1906. Motor boats were then in operation on canals, but they were few in number and did little business, except the carrying of passengers. The great majority of the power boats were, as in 1916, propelled by steam and used as tugs.

CANALS AND CANALIZED RIVERS.

The canals themselves may be divided into three classes: Those owned and operated by the Federal Government, by state governments, and by corporations. The locks on rivers which have been improved or made navigable are, save in a few instances, owned and operated by the Federal Government, and such rivers are generally known as ship canals. The Federal canals, the canalized rivers, and a number of the state and corporation canals are used for the transportation of freight in ships; the state and corporation canals for the most part for the transportation of freight in canal boats.

The information concerning the state and corporation canals was secured from the canal officials and is for the calendar year 1916; that for the Federal canals and canalized rivers is from the annual reports of the Chief of Engineers of the United States Army, unless otherwise noted, and covers the fiscal year ended June 30, 1916.

TABLE 61.—NUMBER, MILEAGE (INCLUDING SLACK WATER), AND COST OF CANALS AND CANALIZED RIVERS IN THE UNITED STATES: 1916, 1906, 1889, AND 1880.

	Total.	State and corporation canals.	Government canals.	Canalized rivers.
Number:				
1916.....	74	24	22	28
1906.....	64	29	12	23
1889.....	67	37	9	21
1880.....	52	39	2	11
Mileage:				
1916.....	6,133.62	1,467.17	281.39	4,385.06
1906.....	3,644.60	2,046.01	78.19	1,520.40
1889.....	3,383.27	2,264.60	40.63	1,078.04
1880.....	3,235.78	2,746.18	10.00	479.60
Cost:				
1916.....	\$483,511,573	\$316,353,329	\$58,238,594	\$108,919,650
1906.....	283,208,863	213,797,297	26,524,588	42,886,978
1889.....	188,185,880	150,481,825	20,517,133	17,186,922
1880.....	183,952,302	167,205,810	7,832,009	8,914,483

The number of Government canals and of canalized rivers has continuously increased since 1880, while the number of canals owned by states and corporations has as continuously decreased. Five state and corporation canals ceased operation during the period 1906 to 1916, compared with a decrease of 8 from 1889 to 1906. The loss for this earlier period (1889-1906) carried a net total decrease of 3

in the total number for canals and canalized rivers under all kinds of ownership, but the loss during the later period was overcome by the gain in Government canals and canalized rivers, the net increase being 10.

During the 36 years covered by the table there has been the significant increase of 3,905.46 miles, or over eight fold, in canalized rivers, and of 271.39 miles, or over twenty-seven fold, in Government canals. The decrease in mileage of state and corporation canals during this same period was 1,279.01 miles. These canals in 1916 had a length of 1,467.17 miles, or only 23.9 per cent of the mileage of all canals and canalized rivers; in 1880 their length was 2,746.18, or 84.9 per cent of all. If, however, canalized rivers are omitted from the comparison and canals only considered, the mileage of these same state and corporation canals in 1916 was more than four-fifths of the total.

The abandonment of 705.51 miles of canals and canalized rivers from 1906 to 1916 is shown in Table 62, which also gives the record prior to 1880, from 1880 to 1889, and from 1889 to 1906.

TABLE 62.—LENGTH AND COST OF ABANDONED CANALS AND CANALIZED RIVERS: 1916, 1906, 1889, AND 1880.

	Length (miles).	Cost of construction and improvement.
Total.....	3,546.78	\$98,873,923
Abandoned canals up to 1880.....	1,953.56	44,013,166
Abandoned canals, 1880 to 1889.....	261.69	7,157,850
Abandoned canals, 1889 to 1906.....	626.02	21,997,779
Abandoned canals, 1906 to 1916.....	705.51	25,705,128

Canals abandoned from 1906 to 1916 are shown by state, name, mileage, and cost in Table 63.

TABLE 63.—NAME, LENGTH, AND COST OF CONSTRUCTION OF CANALS ABANDONED BETWEEN 1906 AND 1916.

STATE AND NAME.	Length (miles).	Cost of construction and improvement.
Aggregate.....	703.51	\$25,705,128
State and corporation canals.....	687.75	20,716,264
New York: Delaware and Hudson.....	9.00	65,000
Pennsylvania: Lehigh Coal and Navigation Co. (part).....	60.75	2,433,350
North Carolina: New Bern and Beaufort.....	5.00	35,000
Georgia: Augusta.....	9.00	2,090,263
Ohio: Ohio and branches.....	326.00	7,904,971
Miami and Erie.....	269.00	8,062,680
Texas: Morris and Cummings.....	9.00	125,000
Government canals.....	17.76	4,988,864
Iowa: Des Moines Rapids.....	12.00	4,666,889
South Carolina: Fenwicks Island.....	0.33	50,000
Texas: Morgan Canal and cut.....	5.43	271,975

The mileage abandoned during the 10 years from 1906 to 1916 and the cost of such construction was greater than that for either of the other two definite periods since 1880, as shown in Table 62. Of this abandoned mileage, that classed as state and corporation formed 97.5 per cent and of the cost 80.6 per cent.

Table 64 shows the total tonnage of freight carried on each of the three classes of canals for 1916, 1906, 1889, and 1880.

TABLE 64.—TONS OF FREIGHT CARRIED ON STATE AND CORPORATION CANALS, GOVERNMENT CANALS, AND CANALIZED RIVERS: 1916, 1906, 1889, AND 1880.

[The figures in this table represent the freight tonnage carried on the canals of the United States, each canal being regarded as a single unit.]

CLASS.	FREIGHT CARRIED (TONS OF 2,000 POUNDS).			
	1916	1906	1889	1880
Total.....	225,933,929	122,434,405	48,668,325	21,044,292
State and corporation canals.....	5,782,185	6,606,814	13,269,600	16,304,323
Government canals.....	192,069,392	96,729,333	23,904,209	1,244,279
Canalized rivers.....	28,082,352	19,098,258	6,494,516	3,495,690

There has been a continuous growth since 1880 in the traffic on Government canals and canalized rivers, while a decrease for each of the several periods is shown in that on state and corporation canals.

The increase in total freight carried on all canals and canalized rivers from 1906 to 1916 was 103,499,524 tons, or 84.5 per cent. The decrease in quantity carried on state and corporation canals, 1906 to 1916, was 824,629 tons, or 12.5 per cent. This was not so great as the decrease during the previous period, which was 6,662,786 tons, or 50.2 per cent. The Government canals show large gains—95,340,059 tons, or 98.6 per cent, in freight carried, 1906 to 1916, compared with 67,825,124 tons, or 234.7 per cent, from 1889 to 1906. Canalized rivers also show large increases in freight for the corresponding periods, 8,984,094 tons, or 47 per cent, and 12,603,742 tons, or 194.1 per cent, respectively.

The Sault Ste. Marie Canals connecting Lake Superior with Lake Huron—one under the control and operation of the United States and the other under the control and operation of the Canadian Government—are great arteries of commerce, this fact being reflected in the net registered tonnage of the vessels passing through them from year to year and in the increasingly large quantity of freight moved. Table 65 shows the net registered tonnage of vessels passing through these two canals and the total tons of freight carried annually, from 1895 to 1916, inclusive.

TABLE 65.—NET TONNAGE OF VESSELS AND TOTAL FREIGHT PASSING THROUGH BOTH AMERICAN AND CANADIAN CANALS AT SAULT STE. MARIE: 1895 TO 1916.¹

YEAR.	Net registered tonnage.	Total freight (tons of 2,000 pounds).	YEAR.	Net registered tonnage.	Total freight (tons of 2,000 pounds).
1916.....	69,824,463	91,888,219	1905.....	36,617,699	44,270,680
1915.....	56,399,147	71,290,304	1904.....	24,364,138	31,546,103
1914.....	41,986,339	55,369,934	1903.....	27,736,444	34,674,437
1913.....	57,989,715	79,718,344	1902.....	31,955,582	35,961,146
1912.....	56,736,807	72,472,676	1901.....	24,626,976	28,403,065
1911.....	41,653,483	53,477,216	1900.....	22,315,834	25,643,073
1910.....	49,856,123	62,363,218	1899.....	21,958,347	25,255,810
1909.....	46,751,717	57,895,149	1898.....	18,622,754	21,234,664
1908.....	31,091,730	41,390,557	1897.....	17,619,933	18,982,755
1907.....	44,087,974	58,217,214	1896.....	17,249,418	16,239,061
1906.....	41,098,324	51,751,080	1895.....	16,806,781	15,062,580

¹ This table is compiled from Statistical Report of Lake Commerce and St. Mary's Canal, prepared from Official Records under direction of the Corps of Engineers, United States Army.

The increase in tonnage of vessels passing through both canals from 1906 to 1916 was 28,726,139, or 69.9 per cent, and in freight carried, 40,137,139 tons, or 77.6 per cent.

Table 66 gives from the annual reports of the Chief of Engineers, United States Army, and from reports of canal officials, the net tons of freight carried on ship canals, including canalized rivers, and on "all other" canals, for 1916, 1906, 1889, and 1880.

A ship canal is one intended for navigation by sea-going vessels. The statistics for ship canals include those for all Government canals, for all canalized rivers, and for the following canals owned by states and corporations: Delaware—Chesapeake and Delaware; Louisiana—Harvey's, Lake Borgne, New Basin, Old Basin; Massachusetts—Cape Cod Ship; Michigan—Torch

Lake; New Jersey—Delaware and Raritan; Virginia—Dismal Swamp. Ship canals for which no freight figures are given for 1916 in the reports quoted are: Illinois—Chicago Drainage and Ship; Louisiana—Company's, Secolas; North Carolina—Fairfield.

TABLE 66.—NET TONS OF FREIGHT CARRIED ON SHIP CANALS, INCLUDING CANALIZED RIVERS, AND ALL OTHER CANALS: 1916, 1906, 1889, AND 1880.

[The figures in this table represent the freight tonnage carried on the canals of the United States, each canal being regarded as a single unit.]

	1916	1906	1889	1880
Total.....	225,933,929	122,434,405	48,668,325	21,044,292
Ship canals.....	223,739,624	118,114,267	38,905,820	5,076,391
All other.....	2,194,305	4,320,138	9,762,505	15,967,901

The freight tonnage moved on the ship canals has increased at a rapid rate since 1880, when only 24.1 per cent of all canal freight was reported from these waterways. In 1889 their proportion had increased to 79.9 per cent, in 1906 to 96.5 per cent, and in 1916 the freight carried on the ships that went through these canals and canalized rivers amounted to 99 per cent of all canal freight reported.

Table 67 shows the number of tons of freight carried, by states, on each of the several classes of canals, for 1916, 1906, 1889, and 1880; and Table 68 shows number, dimensions, date of construction, etc., for such canals to 1916.

Table 69 shows detailed statistics, by divisions, for all vessels, by classes and occupation, and Table 70, by classes and character of ownership: 1916.

TABLE 67.—TONS OF FREIGHT CARRIED ON STATE AND CORPORATION CANALS, GOVERNMENT CANALS, AND CANALIZED RIVERS: 1916, 1906, 1889, AND 1880.¹

CLASS, STATE, AND NAME.	1916	1906	1889	1880	CLASS, STATE, AND NAME.	1916	1906	1889	1880
Aggregate.....	226,933,929	122,434,405	48,663,325	21,044,292	GOVERNMENT CANALS—continued.				
State and corporation canals.....	5,782,185	6,606,814	13,269,600	16,304,323	Michigan—Continued.				
Government canals.....	192,069,392	96,729,333	28,904,209	1,244,279	St. Clair Flats.....	95,370,752	¹¹ 51,359,071	19,717,860	(⁹)
Canalized rivers.....	28,082,352	19,098,253	6,494,516	3,495,690	Keweenaw.....	2,227,054	¹² 2,413,445	¹³ 257,987	(⁹)
STATE AND CORPORATION CANALS.....	5,782,185	6,606,814	13,269,600	16,304,323	Illinois:				
Massachusetts:					Illinois and Mississippi.....	25,358	699	(²)	.....
Cape Cod ship.....	933,566	(²)	(²)	(²)	Iowa:				
New York.....	1,625,050	3,627,907	6,816,304	7,766,969	Des Moines Rapids.....	(²)	8,520	794,280	(⁴)
Erie and branches.....	917,689	2,385,491	3,673,554	4,608,651	Kentucky:				
Champlain.....	506,528	740,983	1,187,038	1,200,503	Louisville and Portland.....	6,044,914	1,053,526	618,060	(⁴)
Oswego.....	135,948	172,223	170,078	427,863	Wisconsin:				
Cayuga and Seneca.....	44,421	164,874	196,138	125,331	Sturgeon Bay and Lake Michigan.....	630,416	617,210	(⁵)	(⁴)
Black River.....	20,464	77,331	143,561	75,308	Alabama.....	54,853			
Delaware and Hudson.....	(⁹)	87,000	1,445,935	1,329,313	Muscle Shoals and Elk River				
New Jersey.....	342,455	513,043	1,738,905	1,857,568	Shoals.....	10,439	(¹³)	(¹³)	(¹³)
Delaware and Raritan.....	331,006	424,986	1,276,269	1,348,082	Colbert Shoals.....	44,414	(²)	(²)	(²)
Delaware and Raritan feeder.....	11,449	88,057	462,636	503,486	Texas.....	5,587,986			
Morris.....	(⁴)	(⁴)	(⁵)	6,000	Port Arthur.....	4,618,501	(⁵)	(⁵)	(⁵)
Penns Neck.....	(⁴)	(⁴)	(⁵)		Sabine-Neches.....	965,722	(⁵)	(⁵)	(⁵)
Pennsylvania.....	376,047	294,979	1,359,665	2,607,535	Galveston-Brazos.....	3,763	(⁵)	(⁵)	(⁵)
Pennsylvania.....	(⁴)	(⁴)	423,073	891,798	Morgan.....	(⁵)	(⁵)	(⁵)	(⁵)
Susquehanna and Tidewater.....	(⁴)	(⁴)	125,555	362,295	Oregon.....	221,097			
Schuylkill Navigation Co.....	42,540	54,354	219,697	630,416	Dalles-Celilo.....	8,684	(²)	(²)	(²)
Lehigh Coal and Navigation Co.....	228,141	240,625	591,340	718,338	Cascades.....	37,280	(¹⁴)	(¹⁴)	(¹⁴)
Union Navigation Co.....	(⁴)	(⁴)	(⁵)	23,853	Willamette.....	175,133	(¹⁵)	(¹⁵)	(¹⁵)
Muney Navigation Co.....	(⁴)	(⁴)	(⁵)	8,835	Washington.....	4,428,917			
Delaware Division.....	105,366	(²)	(²)	(²)	Lake Washington Ship.....	4,359,476	(²)	(²)	(²)
Delaware:					Port Townsend and Oak Bay.....	69,441	(²)	(²)	(²)
Chesapeake and Delaware.....	920,468	683,086	736,879	959,146	CANALIZED RIVERS.....	28,082,352	19,098,253	6,494,516	3,495,690
Maryland:					New York:				
Chesapeake and Ohio.....	181,759	225,143	(⁵)	655,423	Hudson.....	3,190,471	(²)	(²)	(²)
Virginia.....	413,679	435,404	395,004	532,662	Pennsylvania.....	21,293,923	16,091,000	3,294,932	3,450,400
Albemarle and Chesapeake.....	(⁷)	95,269	316,793	400,000	Ohio.....	6,044,914	3,247,753	(⁵)	(⁵)
Lake Drummond (Dismal Swamp).....	413,679	340,135	78,211	6,731	Monongahela.....	12,875,673	11,447,444	3,294,932	3,450,400
Alexandria and Georgetown.....	(⁸)	(⁸)	(⁸)	125,931	Allegheny.....	2,373,336	1,395,803	(²)	(²)
North Carolina.....			2,124	40,000	West Virginia.....	1,573,066	1,720,399	1,260,859	.....
Fairfield.....	(⁹)	(⁹)	2,124	40,000	Kanawha.....	1,513,827	¹¹ 1,613,839	1,145,202	(⁵)
New Bern and Beaufort.....	(⁹)	(⁹)	(⁹)	(⁹)	Little Kanawha.....	59,239	¹¹ 106,510	115,657	(⁵)
Georgia.....		7,004	40,392	23,602	North Carolina:				
Augusta.....	(⁹)	7,004	23,668	2,697	Cape Fear.....	100,846	(²)	(²)	(²)
Ogeechee.....	(⁴)	(⁴)	16,724	20,905	South Carolina:				
Florida:					Congaree.....	5,364	(⁵)	(²)	(²)
Santa Fe.....	(⁴)	(⁴)	1,000	(⁵)	Ohio:				
Ohio.....	84,052	1,107,176	791,962	791,962	Muskingum.....	127,277	¹¹ 50,668	10,281	45,290
Ohio and branches.....	(⁹)	8,818	129,398	429,626	Illinois.....	246,580	33,178	180,264	.....
Walhonding.....	(⁴)	(⁴)	948	3,309	Illinois.....	¹⁶ 239,677	24,943	180,264	(⁵)
Hocking.....	(⁴)	(⁴)	7,353	35,290	Wahash.....	676	3,990	(²)	(²)
Miami and Erie.....	(⁹)	75,234	969,477	323,737	Galena.....	6,227	4,245	(²)	(²)
Illinois.....		6,470	742,391	751,360	Wisconsin.....	167,548	¹¹ 263,589	671,952	.....
Illinois and Michigan.....	(⁵)	6,470	742,391	751,360	Chippewa.....	(⁴)	(⁴)	325,477	(⁵)
Chicago Drainage and Ship.....	(⁵)	(⁵)	(²)	(²)	Fox.....	167,548	¹¹ 263,589	346,475	(⁵)
Michigan:					Missouri:				
Torch Lake.....	470,387	(²)	(²)	(²)	Osage.....	13,999	(²)	(²)	(²)
Louisiana.....	513,774	683,900	293,070	318,096	Kentucky.....	462,689	729,428	1,076,228	.....
New Basin.....	127,927	500,000	226,594	177,108	Kentucky.....	177,191	¹¹ 201,510	256,950	(⁵)
Old Basin.....	94,467	60,000	66,476	140,988	Green and Barron.....	182,681	342,495	819,278	(⁵)
Harvey's.....	163,255	50,000	(⁵)	(⁵)	Big Sandy.....	89,874	¹¹ 148,623	(⁸)	(⁵)
Company's.....	(⁴)	(⁴)	(⁵)	(⁵)	Rough.....	12,943	36,800	(³)	(²)
Secolas.....	(⁴)	(⁴)	(⁵)	(⁵)	Tennessee.....	386,957	119,009		
Lake Borgne.....	128,125	23,900	(²)	(²)	Cumberland.....	119,009		(⁵)	(²)
Texas:					Above Nashville.....	263,953			
Morris and Cummings.....	(⁴)	2,000	(⁵)	(⁴)	Below Nashville.....	123,004			
Oregon:					Alabama.....	488,060	34,077		
Portland General Electric Co.....	(⁹)	43,826	36,690	(⁵)	Black Warrior.....	457,109	16,281	(⁵)	(⁵)
GOVERNMENT CANALS.....	192,069,392	96,729,333	28,904,209	1,244,279	Coosa.....	30,951	(⁵)	(⁵)	(⁵)
New York:					Muscle Shoals and Elk River				
Black Rock Canal.....	1,908,769	(²)	(²)	(²)	Shoals.....	(⁷)	17,796	(⁵)	(²)
Delaware:					Arkansas.....	¹⁷ 20,101	7,999	(²)	(⁵)
Lewis.....	26,968	(²)	(²)	(²)	Ouachita.....	(⁵)	(²)	(²)	(⁵)
Virginia:					Upper White.....	¹⁷ 20,101	7,999	(⁵)	(⁵)
Albemarle and Chesapeake.....	141,029	(¹⁰)	(¹⁰)	(¹⁰)	Texas.....	4,841			
South Carolina.....	27,128				Trinity.....	4,841	(²)	(²)	(²)
Fenwicks Island.....	(³)	(⁵)	(²)	(²)	Brazos.....	(⁵)	(²)	(²)	(²)
Etherville and Minim Creek.....	27,123	(⁵)	(²)	(²)	Oregon.....	630	48,911		
Florida:					Yamhill.....	630	2,027	(²)	(²)
Channel.....	25,811	(²)	(²)	(²)	Cascades Columbia River.....	(⁷)	46,884	(⁵)	(⁵)
Michigan.....	172,946,146	95,049,378	27,491,869	1,244,279					
St. Marys Falls—South.....	75,348,340	41,276,862	7,516,022	1,244,279					
St. Marys Falls—North.....									

¹ The figures relating to Government canals and canalized rivers were obtained from the reports of the Chief of Engineers of the United States Army, and those for the state and corporation canals directly from the canal officials.

² Not opened.

³ Abandoned since 1906.

⁴ Abandoned since 1889.

⁵ Not reported.

⁶ Canal not in operation in 1889.

⁷ See Government canals.

⁸ Abandoned since 1880.

⁹ See Government canals (Willamette River).

¹⁰ See state and corporation canals.

¹¹ Fiscal year ending June 30, 1905.

¹² Includes Keweenaw Bay and Portage Lake Canals.

¹³ See canalized rivers.

¹⁴ See canalized rivers (Columbia River).

¹⁵ See state and corporation canals (Portland General Electric Co.).

¹⁶ Fiscal year ending June 30, 1916.

¹⁷ Calendar year 1915.

TABLE 68.—NUMBER, DIMENSIONS, DATE OF CONSTRUCTION, AND COST OF STATE AND CORPORATION CANALS, GOVERNMENT CANALS, AND CANALIZED RIVERS: 1916.¹

CLASS, STATE, AND NAME.	Points connected.	Number of canals.	Opened for traffic.	LENGTH.			WIDTH.		Depth (feet).	LOCKS.			Cost of construction and improvement.
				Total (miles).	Canal (miles).	Slack water (miles).	Surface (feet).	Bottom (feet).		Number.	Length (feet).	Width (feet).	
Aggregate.....		74		6,133.62	1,218.22	4,915.40				687			\$483,511,573
State and corporation canals.....		24		1,467.17	936.83	530.34				441			316,353,329
Government canals.....		22		281.39	281.39					68			58,238,594
Canalized rivers.....		28		4,385.06		4,385.06				178			108,919,650
STATE AND CORPORATION CANALS.....		24		1,467.17	936.83	530.34				441			316,353,329
Massachusetts:													
Cape Cod Ship ²	Buzzard-Cape Cod Bay.....	1	1914	13.00	7.68	5.32	200	100	25				13,500,000
New York.....		5		553.79	204.45	349.34				166			185,949,120
Erie and branches ³	Troy-Tonawanda.....	1	1825	340.40	122.40	218.00	150	75	12	35	310	45	139,214,929
Champlain ³	Whitehall-Troy.....	1	1822	62.66	23.55	39.11	125	75	12	11	310	45	21,691,584
Oswego ³	Oswego-Three Rivers.....	1	1828	23.50	23.50		200	200	12	7	310	45	12,994,329
Cayuga and Seneca ³	Mays Point-Ithaca-Montour Falls.....	1	1839	92.23		92.23	200	200	12	4	310	45	8,158,326
Black River ³	Rome-Lyons Falls.....	1	1849	35.00	35.00		42	28	4	109	90	15	3,894,952
New Jersey:		3		172.69	172.69				49			7,873	7,873,637
Delaware and Raritan ²	New Brunswick-Bordentown.....	1	1834	44.00	44.00		80	40	8	13	210	24	5,113,749
Delaware and Raritan (feeder).....	Raven Rock-Trenton.....	1	1834	22.00	22.00		60	30	6	4	100	24	
Morris.....	Jersey City-Easton, Pa.....	1	1836	106.69	106.69		40	25	5	32	95	11	2,759,888
Pennsylvania:		3		196.46	146.83	49.63				129			18,122,016
Schuylkill Navigation Co.....	Philadelphia-Port Clinton.....	1	1825	89.96	50.33	39.63	58	40	6	55	110	18	11,055,557
Lehigh Coal and Navigation Co.....	Manch Chunk-Easton.....	1	1821	47.25	37.25	10.00	60	45	6	49	100	22	4,635,109
Delaware Division Canal.....	Easton-Bristol.....	1	1916	59.25	59.25		45	26	6	25	100	22	2,433,350
Delaware:													
Chesapeake and Delaware ²	Delaware River-Chesapeake Bay.....	1	1829	29.63	13.63	16.00	60	40	10	3	220	24	5,000,000
Maryland:													
Chesapeake and Ohio.....	Washington, D. C.-Cumberland, Md.....	1	1850	184.50	180.70	3.80	68	31	6	75	100	15	14,000,000
Virginia:													
Lake Drummond ² (Disposal Swamp).....	Elizabeth River, Va.-Pasquotank River, N. C.....	1	1794	23.00	22.00	1.00	70	40	9	2	250	39	3,301,000
North Carolina:													
Fairfield ²	Fairfield-Alligator River.....	1	1868	4.00	4.00		26	26	7				60,000
Illinois.....		2		133.60	127.35	6.25				12			64,638,495
Illinois and Michigan ³	Chicago-La Salle.....	1	1848	95.00	95.00		60	30	6	11	103	17	9,429,606
Chicago Drainage and Ship ²	Chicago-Lockport.....	1	1900	38.60	32.35	6.25	226	174	22	1	130	22	55,208,889
Michigan:													
Torch Lake ²	Torch Lake-Torch Bay.....	1	1875	4.00	4.00		110	90	20				597,075
Louisiana:													
New Basin ²	New Orleans-Lake Pontchartrain.....	1	1836	6.50	6.50		100	80	10	5			3,311,986
Old Basin ²	New Orleans-St. Johns Bayou.....	1	1794	5.50	2.00	3.50	84		5				1,384,634
Harvey's ²	Mississippi River at New Orleans.....	1	1835	36.50	13.00	23.50	75	50	6	1	153	30	227,352
Company's.....	Mississippi River at La Fourche.....	1	1836	97.00	25.00	72.00	100	95	6	1	176	30	750,000
Lake Borgne ²	Mississippi River-Lake Borgne.....	1	1900	7.00	7.00		100	85	6	2	210	40	600,000
										1	230		350,000
GOVERNMENT CANALS.....		22		281.39	281.39					68			58,238,594
New York:													
Black Rock.....	Along east bank Niagara River at Buffalo.....	1	1914	3.20	3.20		200		20	1	650	70	3,943,702
Delaware:													
Lewes.....	Delaware Bay-Rehoboth Bay.....	1	1916	12.00	12.00			40	3				150,126
Virginia:													
Albemarle and Chesapeake.....	Elizabeth River-North Landing River.....	1	1860	11.10	11.10			50	8	1	220	39	560,213
South Carolina:													
Estherville-Minim Creek.....	Santee River-Winyah Bay.....	1	1906	5.00	5.00		20		6				174,620
Florida:													
Channel.....	Apalachicola River-St. Andrews Bay, Fla.....	1	1915	36.50	36.50			65	5				505,930
Michigan:													
St. Marys Falls-South.....	Around Falls-St. Marys River.....	1	1855	1.60	1.60		260		25	2	515	80	17,162,910
St. Marys Falls-North.....	Around Falls-St. Marys River.....	1	1914	1.60	1.60		260		25	1	800	100	9,046,349
Keweenaw.....	Lake Superior-Portage Bay-Keweenaw Bay.....	1	1873	25.00	25.00			120	20		1,350	80	5,041,291
St. Clair Flats.....	St. Clair River-Lake St. Clair.....	1	1889	3.33	3.33		300		20				1,780,379
Illinois:													
Illinois and Mississippi.....	La Salle, Ill.-Mississippi River.....	1	1907	75.00	75.00		80		7	33	150	35	1,288,891
Kentucky:													
Louisville and Portland.....	Around Falls of Ohio River at Louisville, Ky.....	1	1830	2.00	2.00		200		9	2	350	80	7,555,999
Wisconsin:													
Sturgeon Bay-Lake Michigan.....	Sturgeon Bay-Lake Michigan.....	1	1881	1.36	1.36		160		21	1	616	110	6,960,920
Alabama:													
Muscle Shoals and Elk River Shoals.....	At Muscle Shoals and at Elk River Shoals.....	2		26.06	26.06					12			559,637
Colbert Shoals.....	At Colbert Shoals.....	1	1890	18.00	14.50			70	5	9	284	60	5,513,905
					3.50					2	289	60	3,191,726
					8.06	8.06				1	340	80	2,322,179

¹ The figures relating to Government canals and canalized rivers were obtained from the reports of the Chief of Engineers of the United States Army for the fiscal year ending June 30, 1916, and those for state and corporation canals directly from the canal officials.

² Ship canals.

³ State canals.

TABLE 68.—NUMBER, DIMENSIONS, DATE OF CONSTRUCTION, AND COST OF STATE AND CORPORATION CANALS, GOVERNMENT CANALS, AND CANALIZED RIVERS: 1916—Continued.

CLASS, STATE, AND NAME.	Points connected.	Number of canals.	Opened for traffio.	LENGTH.			WIDTH.		Depth (feet).	LOCKS.			Cost of construction and improvement.
				Total (miles).	Canal (miles).	Slack water (miles).	Surface (feet).	Bottom (feet).		Number.	Length (feet).	Width (feet).	
GOVERNMENT CANALS—con.													
Texas		3		59.00	59.00					1			\$2, 149, 467
Port Arthur	Taylor's Bayou-Sabine Pass.	1	1899	7.00	7.00		150		26				1, 471, 880
Galveston and Brazos	West Galveston Bay-Brazos River.	1	1853	36.00	36.00			40	4				233, 654
Sabine Neches	Port Arthur Canal-Sabine River.	1	1916	16.00	16.00		90		25	1	600	80	443, 933
Oregon		3		9.73	9.73					12			9, 484, 978
Willamette River	Willamette Falls near Oregon City.	1	1873	0.66	0.66			40	2	5	210	40	841, 186
Cascades	At the Cascades	1	1896	0.57	0.57		90		8	2	{ 521 514 300 }	90	3, 913, 198
Dalles-Celilo	The Dalles-Celilo Falls	1	1915	8.50	8.50			65	8	5		45	4, 730, 594
Washington		2		8.91	8.91					2			3, 516, 187
Port Townsend-Oak Bay	Port Townsend-Oak Bay	1	1915	0.91	0.91			75	15				73, 322
Lake Washington Ship	Puget Sound-Lake Washington	1	1916	8.00	8.00			100	30	2	{ 825 150 }	80 30	3, 442, 865
CANALIZED RIVERS				28	4,385.06	4,385.06				178			108,919,650
New York:													
Hudson River	Waterford-Hudson	1	1915	38.00		38.00			14	1	520	45	3, 807, 833
Pennsylvania		3		1,120.50		1,120.50				36			49, 163, 169
Monongahela	Pittsburgh-Fairmont, W. Va.	1	1879	128.00		128.00			6	{ 6 9 18 18 }	{ 222 319 616 330 }	56	8, 105, 050
Ohio	Pittsburgh-Cairo	1	1885	968.50		968.50			9			110	39, 603, 695
Allegheny	Pittsburgh-Natrona	1	1902	24.00		24.00			4	3		56	1, 454, 424
West Virginia		2		138.00		138.00				15			4, 507, 124
Great Kanawha	Loup Creek Shoals - Point Pleasant	1	1889	90.00		90.00			6	{ 4 6 5 }	{ 300 342 143 }	50 55 23	4, 248, 042
Little Kanawha	Mouth to Creston	1	1874	48.00		48.00			4	2		23	259, 082
North Carolina:													
Cape Fear River	Kings Bluff-Browns Landing	1	1916	32.00		32.00			8	2	200	40	824, 462
South Carolina:													
Congaree	Gervais Street Bridge-Columbia-Granby	1	1904	2.00		2.00			6	1	170	55	281, 000
Ohio:													
Muskingum	Dresden-Marietta	1	1840	91.00		91.00			6	11	184	36	2, 360, 690
Illinois		3		241.00		241.00				4			3, 263, 757
Illinois	La Salle-Grafton	1	1889	223.00		223.00			6	2	350	75	2, 903, 757
Wabash	Grand Rapids near Mount Carmel	1	1893	12.00		12.00			4	1	248	52	260, 000
Galena	At Galena	1	1894	6.00		6.00			2	1	273	52	100, 000
Wisconsin:													
Fox	Portage City-Green Bay	1	1856	176.00		176.00			5	{ 6 21 }	{ 160 170 }	35	3, 894, 159
Minnesota:													
Mississippi River	St. Paul-Minneapolis; at Keokuk, Iowa (Des Moines Rapids); at Moline, Ill. (Rock Island Rapids)	1	{ 1907 1877 1907 }	19.36		{ 4.86 12.00 2.50 }			{ 7 7 6 }	{ 3 3 3 }	{ 350 380 325 }	80 110 80	8, 354, 430
Missouri:													
Osage River	Mouth to 7 miles above	1	1906	7.00		7.00			3	1	220	42	635, 809
Kentucky		4		549.00		549.00				27			8, 542, 966
Kentucky	Carrollton-Beattyville	1	1844	255.00		255.00			6	{ 5 9 }	{ 175 188 }	36	4, 094, 442
Green and Barren	Mouth Green River-Mammoth Cave; Mouth Barren River-Bowling Green	1	1841	225.50		{ 196.00 29.50 }			5	7	163	36	2, 774, 365
Big Sandy, and Tug and Levisa Forks	Louisa { Catlettsburg Gallup Saltpetre }	1	1897	39.00		{ 27.00 8.20 3.80 }			6	5	192	55	1, 568, 659
Rough	Mouth-Hartford	1	1896	29.50		29.50			4	1	145	27	106, 500
Tennessee and Kentucky		2		518.70		518.70				12			5, 314, 009
Cumberland	Nashville-Burnside, Ky.	1	1905	326.10		326.10			6	8	310	52	3, 221, 836
Cumberland	Below Nashville 192.60 miles	1	1905	192.60		192.60			6	4	310	52	2, 092, 173
Alabama		2		528.00		528.00				22			12, 010, 398
Black Warrior, Tombigbee	McGrews Shoals, Sanders Ferry, and Nichols Shoals.	1	1895	362.50		362.50			6	17	322	52	9, 652, 881
Coosa	Rome, Ga.-Riverside, Ala.	1	1890	165.50		165.50			3	{ 4 1 }	{ 210 322 }	40 52	2, 357, 517
Arkansas		2		152.00		152.00				6			2, 632, 708
Upper White	1 mile below Batesville to Guion	1	1904	33.00		33.00			3	3	175	36	813, 197
Ouachita	Franklin Shoals, Ark., to Monroe, La.	1	1912	119.00		119.00			6	3	300	55	1, 819, 511
Texas		2		754.50		754.50				9			3, 254, 971
Trinity River	Dallas-White Rock Shoals	1	1909	330.50		330.50			7	7	177	50	1, 928, 038
Brazos River	Mouth-Waco	1	1915	424.00		424.00			4	2	{ 170 143 }	55	1, 326, 933
Oregon:													
Yamhill	Mouth-McMinnville	1	1900	18.00		18.00			3	1	210	40	72, 165

TABLE 69.—ALL VESSELS, BY CLASS.

	CLASS, OCCUPATION, AND DIVISION.	Number of vessels.	TONNAGE.		RIGGED.				HORSEPOWER OF ENGINES.	
			Gross.	Net.	Screw.	Side wheel.	Stern wheel.	All other.	Steam.	Gasoline.
1	United States.....	43,110	12,395,236	10,259,604	16,174	433	1,451	1	4,344,891	412,698
2	Steam and motor.....	18,059	6,194,243	4,309,648	16,174	433	1,451	1	4,344,891	412,698
3	Freight and passenger.....	5,362	5,432,353	3,794,313	4,705	217	440	.....	3,167,780	95,559
4	Tugs and other towing vessels.....	3,689	264,135	174,038	2,954	19	716	.....	655,831	48,462
5	Ferryboats.....	611	224,328	154,877	274	178	158	1	223,610	6,486
6	Fishing.....	3,478	96,681	63,219	3,448	.....	30	.....	80,121	78,395
7	Yachts.....	3,785	111,620	78,170	3,714	8	63	.....	142,264	148,957
8	Miscellaneous.....	1,134	65,126	45,031	1,079	11	44	.....	75,285	34,839
9	Steam.....	6,532	5,943,388	4,121,944	5,367	391	773	1	4,344,891	.....
10	Freight and passenger.....	2,713	5,337,952	3,723,944	2,233	206	274	.....	3,167,780	.....
11	Tugs and other towing vessels.....	2,435	246,234	161,107	2,032	14	389	.....	655,831	.....
12	Ferryboats.....	379	219,419	150,819	156	160	62	1	223,610	.....
13	Fishing.....	488	43,677	25,170	487	.....	1	.....	80,121	.....
14	Yachts.....	267	47,626	28,421	258	1	8	.....	142,264	.....
15	Miscellaneous.....	250	48,480	32,483	201	10	39	.....	75,285	.....
16	Motor.....	11,527	250,855	187,704	10,807	42	678	.....	.....	412,698
17	Freight and passenger.....	2,649	94,401	70,369	2,472	11	166	.....	.....	95,559
18	Tugs and other towing vessels.....	1,254	17,901	12,931	922	5	327	.....	.....	48,462
19	Ferryboats.....	232	4,909	4,058	118	18	96	.....	.....	6,486
20	Fishing.....	2,990	53,004	38,049	2,961	.....	29	.....	.....	78,395
21	Yachts.....	3,518	63,994	49,749	3,456	7	55	.....	.....	148,957
22	Miscellaneous.....	884	16,046	12,548	878	1	5	.....	.....	34,839
23	Sail.....	4,740	1,219,739	1,090,265	.....	.....	.....	.....	.....	.....
24	Freight and passenger.....	2,357	1,156,354	1,040,124	.....	.....	.....	.....	.....	.....
25	Fishing.....	1,738	49,565	37,397	.....	.....	.....	.....	.....	.....
26	Yachts.....	869	11,387	9,619	.....	.....	.....	.....	.....	.....
27	Miscellaneous.....	76	3,433	3,135	.....	.....	.....	.....	.....	.....
28	Unrigged.....	20,311	4,981,254	4,859,691	.....	.....	.....	.....	.....	.....
29	Canal boats.....	1,501	198,120	186,260	.....	.....	.....	.....	.....	.....
30	All other unrigged.....	18,810	4,783,134	4,673,431	.....	.....	.....	.....	.....	.....
31	Atlantic coast and Gulf of Mexico.....	25,387	6,614,197	5,457,627.	9,922	257	179	.....	2,447,754	242,989
32	Steam and motor.....	10,358	2,890,009	1,893,193	9,922	257	179	.....	2,447,754	242,989
33	Freight and passenger.....	2,798	2,403,734	1,574,068	2,584	131	83	.....	1,669,276	49,900
34	Tugs and other towing vessels.....	1,856	153,122	93,373	1,781	4	71	.....	420,729	14,786
35	Ferryboats.....	262	153,818	104,862	144	117	1	.....	154,158	1,442
36	Fishing.....	2,011	61,056	39,156	1,988	.....	23	.....	49,696	43,620
37	Yachts.....	2,587	81,766	56,777	2,587	.....	.....	.....	111,025	105,756
38	Miscellaneous.....	844	36,513	24,957	838	5	1	.....	42,870	27,485
39	Steam.....	3,396	2,734,189	1,776,494	3,055	256	85	.....	2,447,754	.....
40	Freight and passenger.....	1,218	2,343,852	1,529,591	1,045	130	43	.....	1,669,276	.....
41	Tugs and other towing vessels.....	1,454	147,631	89,530	1,410	4	40	.....	420,729	.....
42	Ferryboats.....	225	152,951	104,237	107	117	1	.....	154,158	.....
43	Fishing.....	206	29,728	16,780	206	.....	.....	.....	49,696	.....
44	Yachts.....	173	36,023	21,038	173	.....	.....	.....	111,025	.....
45	Miscellaneous.....	120	24,004	15,318	114	6	1	.....	42,870	.....
46	Motor.....	6,962	155,820	116,699	6,867	1	94	.....	.....	242,989
47	Freight and passenger.....	1,580	59,882	44,477	1,539	1	40	.....	.....	49,900
48	Tugs and other towing vessels.....	402	5,491	3,843	371	.....	31	.....	.....	14,786
49	Ferryboats.....	37	867	625	37	.....	.....	.....	.....	1,442
50	Fishing.....	1,805	31,328	22,376	1,782	.....	23	.....	.....	43,620
51	Yachts.....	2,414	45,743	35,739	2,414	.....	.....	.....	.....	105,756
52	Miscellaneous.....	724	12,509	9,639	724	.....	.....	.....	.....	27,485
53	Sail.....	4,257	847,950	748,794	.....	.....	.....	.....	.....	.....
54	Freight and passenger.....	1,972	790,630	704,160	.....	.....	.....	.....	.....	.....
55	Fishing.....	1,718	44,524	33,677	.....	.....	.....	.....	.....	.....
56	Yachts.....	495	10,180	8,598	.....	.....	.....	.....	.....	.....
57	Miscellaneous.....	72	2,616	2,359	.....	.....	.....	.....	.....	.....
58	Unrigged.....	10,772	2,876,238	2,815,640	.....	.....	.....	.....	.....	.....
59	Canal boats.....	445	63,730	61,090	.....	.....	.....	.....	.....	.....
60	All other unrigged.....	10,327	2,812,508	2,754,550	.....	.....	.....	.....	.....	.....
61	Pacific coast (including Alaska).....	4,962	1,215,303	923,863	2,767	48	158	.....	620,579	94,225
62	Steam and motor.....	2,973	735,661	479,341	2,767	48	158	.....	620,579	94,225
63	Freight and passenger.....	1,005	611,021	396,325	895	11	99	.....	490,825	29,431
64	Tugs and other towing vessels.....	642	35,600	23,282	534	.....	49	.....	62,394	22,252
65	Ferryboats.....	76	51,480	35,208	36	35	5	.....	42,591	1,783
66	Fishing.....	850	25,301	16,458	845	.....	5	.....	14,711	27,135
67	Yachts.....	293	8,417	6,558	293	.....	.....	.....	8,173	8,641
68	Miscellaneous.....	107	3,842	2,510	105	2	.....	.....	1,885	4,983
69	Steam.....	798	677,414	438,360	613	38	147	.....	620,579	.....
70	Freight and passenger.....	436	586,846	378,996	332	7	97	.....	490,825	.....
71	Tugs and other towing vessels.....	227	28,372	18,485	182	.....	45	.....	62,394	.....
72	Ferryboats.....	45	49,936	33,991	11	30	4	.....	42,591	.....
73	Fishing.....	72	7,503	4,173	71	.....	1	.....	14,711	.....
74	Yachts.....	11	3,855	2,175	11	.....	.....	.....	8,173	.....
75	Miscellaneous.....	7	852	540	6	1	.....	.....	1,885	.....
76	Motor.....	2,175	58,247	40,981	2,154	10	11	.....	.....	94,225
77	Freight and passenger.....	569	24,175	17,329	563	4	2	.....	.....	29,431
78	Tugs and other towing vessels.....	415	7,228	4,797	411	.....	4	.....	.....	22,252
79	Ferryboats.....	31	1,494	1,217	25	6	1	.....	.....	1,783
80	Fishing.....	778	17,798	12,285	774	.....	4	.....	.....	27,135
81	Yachts.....	282	4,562	3,383	282	.....	.....	.....	.....	8,641
82	Miscellaneous.....	100	2,990	1,970	99	1	.....	.....	.....	4,983

OCCUPATION, AND DIVISION: 1916.

CONSTRUCTION.			Value of vessels.	INCOME.				EMPLOYEES ON VESSELS.		Number of passengers carried.	FREIGHT CARRIED (TONS OF 2,000 POUNDS).		
Metal.	Wood.	Com- posite.		Total.	Freight.	Passenger.	All other.	Num- ber.	Wages.		Exclusive of lighterage.	Lighterage or harbor work.	
3,370	39,619	121	\$979,388,633	\$589,124,887	\$422,920,291	\$52,961,637	\$113,242,959	179,276	\$115,110,891	331,608,614	258,082,659	123,350,315	1
2,531	15,441	87	818,065,866	464,331,090	329,753,906	62,848,471	81,728,713	132,965	89,358,051	330,454,460	187,893,369	6,386,665	2
1,440	3,877	45	677,476,337	384,538,932	329,333,885	42,530,632	12,674,415	70,132	64,774,623	38,095,703	187,797,944	4,208,814	3
581	3,096	12	54,909,495	29,626,487	331,181	87,097	39,208,209	23,476	15,929,657	147,600	62,544	900	4
166	441	4	23,227,174	15,414,979	14,754	10,223,408	5,176,817	4,282	3,947,836	292,177,374	1,070	16,538	5
69	3,407	2	51,910,757	19,043,350	69,141	2,967	18,971,242	16,483	8,388,981	18,049	31,240	-----	6
179	3,587	19	33,447,143	206,097	25	500	205,572	5,975	3,325,947	1,227	10	-----	7
96	1,033	3	13,095,960	5,501,245	4,920	3,867	5,492,458	3,617	2,991,007	14,507	561	2,160,413	8
2,362	4,101	69	772,054,054	440,561,053	324,355,893	51,335,374	64,869,786	108,786	77,103,632	321,770,485	185,125,760	6,139,025	9
1,378	1,232	48	665,984,886	377,764,420	324,064,652	41,437,502	12,262,266	73,727	52,274,573	33,810,297	185,064,922	3,968,697	10
566	1,859	10	51,437,555	36,430,943	264,097	35,684	36,131,162	21,141	14,649,603	82,235	50,678	900	11
158	219	2	22,642,676	14,833,211	13,754	9,861,883	5,007,509	3,922	3,773,236	287,876,753	735	16,538	12
63	425	10	7,696,407	7,049,500	12,485	300	7,030,715	4,942	2,721,529	1,200	9,425	-----	13
120	137	10	16,646,769	93,303	-----	-----	93,303	2,878	1,682,993	-----	-----	-----	14
77	169	4	9,645,761	4,339,676	905	-----	4,338,771	2,176	2,001,638	-----	-----	2,152,890	15
169	11,340	18	46,011,812	23,770,037	5,398,013	1,513,097	16,858,927	24,179	12,254,419	8,683,975	2,767,609	247,640	16
62	2,585	2	13,490,451	6,774,512	5,269,233	1,093,130	412,149	5,405	2,500,050	4,285,406	2,733,022	240,117	17
15	1,237	2	3,471,940	3,195,544	67,084	51,413	3,077,047	2,335	1,250,054	65,365	11,866	-----	18
8	222	2	554,498	531,768	1,000	361,520	169,248	860	174,540	4,300,621	835	-----	19
6	2,982	2	8,214,350	11,993,580	56,656	2,667	11,934,527	11,541	5,667,452	16,849	21,815	-----	20
59	3,450	9	16,800,374	112,794	25	500	112,269	3,097	1,642,954	1,227	10	-----	21
19	864	1	3,450,199	1,161,589	4,015	3,867	1,163,687	1,441	989,369	14,507	661	7,523	22
157	4,573	10	64,103,097	45,842,898	38,814,391	17,726	7,010,781	23,629	10,882,997	867	16,830,817	95,340	23
144	2,213	-----	68,273,449	39,427,327	38,736,658	17,726	6,722,943	13,115	6,991,878	867	16,782,009	63,790	24
3	1,735	-----	3,552,512	6,345,170	77,733	-----	6,267,437	9,492	3,486,736	-----	48,808	-----	25
10	649	10	1,940,513	1,650	-----	-----	1,650	797	357,591	-----	-----	-----	26
76	-----	-----	336,533	68,751	-----	-----	68,751	125	47,152	-----	-----	26,550	27
682	19,605	24	97,210,760	78,950,899	54,351,994	95,440	24,503,465	22,782	14,869,843	1,153,287	53,358,473	116,868,310	28
4	1,497	-----	2,202,752	2,202,752	2,080,635	-----	121,905	-----	538,569	-----	2,185,376	2,494,532	29
678	18,108	24	95,017,008	76,748,459	62,271,459	95,440	24,381,560	21,365	14,331,274	1,153,287	51,173,097	114,373,778	30
1,791	23,557	39	642,114,328	395,211,148	288,287,689	31,475,454	75,448,005	104,224	67,378,700	237,345,627	80,335,771	101,267,073	31
1,436	8,893	29	527,057,790	298,274,571	212,246,077	31,448,801	54,579,693	69,965	48,234,277	237,205,220	41,898,368	2,988,056	32
727	2,069	12	430,299,612	245,760,533	212,145,406	24,776,744	8,828,383	38,355	26,084,263	19,158,111	41,868,488	2,986,496	33
388	1,467	1	37,841,756	26,573,930	44,953	234	26,528,743	11,831	10,096,502	1,982	1,188	-----	34
127	135	-----	14,664,863	10,318,559	-----	6,671,823	3,646,736	2,549	2,437,826	218,045,127	-----	-----	35
19	1,992	-----	9,647,473	12,403,487	53,210	-----	12,350,277	10,166	5,205,201	-----	28,338	-----	36
121	2,452	14	25,590,224	146,078	-----	-----	146,078	4,806	2,643,167	-----	-----	-----	37
64	788	2	9,013,862	3,081,984	2,508	-----	3,079,476	2,258	1,767,318	-----	354	1,560	38
1,357	2,017	22	498,229,447	285,024,224	209,410,213	30,975,127	44,638,884	55,451	40,974,721	234,491,468	40,382,827	2,916,978	39
698	509	11	421,832,646	242,465,651	209,358,250	24,405,921	8,701,480	35,329	24,933,269	17,727,306	40,374,179	2,916,978	40
384	1,069	1	36,861,706	25,558,382	43,643	-----	25,514,839	10,995	9,653,231	-----	360	-----	41
127	98	-----	14,555,401	10,198,522	-----	6,569,206	3,629,316	2,469	2,400,109	216,764,162	-----	-----	42
15	191	-----	5,761,664	4,499,383	8,420	-----	4,490,963	3,270	1,654,605	-----	8,288	-----	43
91	73	9	12,826,874	44,053	-----	-----	44,053	2,283	1,342,026	-----	-----	-----	44
42	77	1	6,391,338	2,258,233	-----	-----	2,258,233	1,103	991,481	-----	-----	-----	45
79	6,876	7	28,828,343	13,250,347	2,835,864	473,674	9,940,809	14,514	7,259,556	2,713,752	1,515,541	71,078	46
29	1,550	1	8,467,148	3,264,832	2,787,156	370,823	1,120,903	3,026	1,150,994	1,430,805	1,494,809	69,518	47
4	398	-----	980,050	1,015,548	1,410	234	1,013,904	836	443,271	1,982	828	-----	48
-----	37	-----	109,462	120,037	-----	102,617	87,717	80	-----	1,280,965	-----	-----	49
4	1,801	-----	3,885,809	7,904,104	44,790	-----	7,859,314	6,896	3,550,506	-----	20,050	-----	50
30	2,379	5	12,763,590	102,025	-----	-----	102,025	2,521	1,301,141	-----	-----	-----	51
12	711	1	2,622,524	823,275	2,508	-----	821,243	1,155	775,837	-----	354	1,560	52
98	4,150	9	46,323,549	35,820,509	29,493,152	17,726	6,309,631	18,672	8,513,087	867	13,348,876	61,640	53
85	1,867	-----	40,824,676	29,758,507	29,417,669	17,726	323,112	8,706	4,861,444	867	13,300,818	61,640	54
3	1,715	-----	3,392,652	6,001,601	75,483	-----	5,926,118	9,080	3,270,535	-----	48,058	-----	55
10	476	9	1,792,288	1,650	-----	-----	1,650	772	345,041	-----	-----	-----	56
72	-----	-----	314,033	58,751	-----	-----	58,751	114	36,067	-----	-----	-----	57
257	10,514	1	68,732,989	61,116,068	46,548,460	8,927	14,558,681	15,587	10,631,336	139,540	25,088,527	98,217,377	58
4	441	-----	914,437	617,159	566,732	-----	50,427	360	206,519	-----	357,545	2,212,352	59
253	10,073	1	67,818,552	60,498,909	45,981,728	8,927	14,508,254	15,227	10,424,817	139,540	24,730,682	96,005,025	60
257	4,701	4	132,524,924	85,030,184	56,574,455	11,571,699	16,884,030	28,466	\$20,483,963	55,408,881	21,856,134	3,271,499	61
201	2,769	3	111,042,115	71,326,603	46,159,841	11,571,699	13,595,063	22,978	17,445,363	55,408,881	15,362,726	169,172	62
146	857	2	89,404,958	57,266,548	45,918,718	9,312,452	2,035,378	14,759	11,737,724	7,105,624	15,339,376	152,634	63
21	621	-----	6,866,384	6,019,784	228,858	40,996	5,749,930	2,412	2,116,600	18,943	21,744	-----	64
9	66	1	6,607,936	3,259,556	2,216,001	2,216,001	1,043,555	825	964,080	48,280,569	-----	16,538	65
15	835	-----	5,054,418	4,471,422	10,758	283	4,460,381	4,478	2,212,981	38	1,399	-----	66
7	286	-----	2,139,937	47,951	-----	-----	47,951	264	202,557	-----	-----	-----	67
3	104	-----	968,482	261,342	1,507	1,967	257,868	240	211,421	3,707	207	-----	68
186	609	3	99,668,156	63,586,647	44,085,428	11,056,024	8,445,195	16,575	13,811,560	52,799,205	14,408,240	73,893	69
133	301	2	85,621,453	54,723,246	43,917,353	8,970,680	1,835,213	13,294	10,715,597	6,032,609	14,393,469	57,355	70
20	207	-----	5,039,359	4,476,873	168,075	89	4,308,709	1,698	1,571,022	92	14,771	-----	71
9	35	1	6,394,550	3,108,836	-----	2,085,255	1,018,681	755	912,615	46,766,504	-----	16,538	72
15	67	-----	1,107,600	1,212,872	-----	-----	1,212,872	601	409,208	-----	-----	-----	73
6	5	-----	1,187,000	45,750	-----	-----	45,750	160	121,962	-----	-----	-----	74
3	4	-----	318,194	24,070	-----	-----	24,070	67	81,156	-----	-----	-----	75
15	2,160	-----	11,373,959	7,739,956	2,074,413	515,675	5,149,868	6,403	3,633,803	2,609,676	954,486	95,279	76
13	556	-----	3,783,505	2,543,302	2,001,365	341,772	200,165	1,465	1,022,127	1,073,015	945,907	95,279	77
1	414	-----	1,827,025	1,542,911	60,783	40,90							

TABLE 69.—ALL VESSELS, BY CLASS, OCCU-

CLASS, OCCUPATION, AND DIVISION.		Number of vessels.	TONNAGE.		RIGGED.				HORSEPOWER OF ENGINES.	
			Gross.	Net.	Screw.	Side wheel.	Stern wheel.	All other.	Steam.	Gasoline.
Pacific Coast (including Alaska)—Continued.										
1	Sail.....	316	226,081	204,143	.....	.....	.....	.....	.....	.....
2	Freight and passenger.....	264	220,929	199,466	.....	.....	.....	.....	.....	.....
3	Fishing.....	20	4,041	3,710	.....	.....	.....	.....	.....	.....
4	Yachts.....	29	592	474	.....	.....	.....	.....	.....	.....
5	Miscellaneous.....	3	519	493	.....	.....	.....	.....	.....	.....
6	Unrigged.....	1,673	253,561	240,379	.....	.....	.....	.....	.....	.....
7	Canal boats.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
8	All other unrigged.....	1,673	253,561	240,379	.....	.....	.....	.....	.....	.....
9	Great Lakes and St. Lawrence River.....	3,462	2,747,687	2,118,718	2,407	35	1	.....	1,052,072	37,211
10	Steam and motor.....	2,443	2,420,626	1,813,442	2,407	35	1	.....	1,052,072	37,211
11	Freight and passenger.....	910	2,350,050	1,767,064	880	30	.....	.....	924,068	5,749
12	Tugs and other towing vessels.....	301	19,590	11,122	300	.....	1	.....	55,563	1,402
13	Ferryboats.....	43	7,264	4,448	42	1	.....	.....	14,505	346
14	Fishing.....	606	10,196	7,513	606	.....	.....	.....	15,702	7,412
15	Yachts.....	459	13,124	9,578	457	2	.....	.....	17,839	20,654
16	Miscellaneous.....	124	20,402	13,717	122	2	.....	.....	24,395	1,648
17	Steam.....	1,362	2,404,763	1,800,567	1,328	34	.....	.....	1,052,072	.....
18	Freight and passenger.....	734	2,347,024	1,764,620	704	30	.....	.....	924,068	.....
19	Tugs and other towing vessels.....	254	19,130	10,750	254	.....	.....	.....	55,563	.....
20	Ferryboats.....	32	7,049	4,278	31	1	.....	.....	14,505	.....
21	Fishing.....	209	6,436	4,210	209	.....	.....	.....	15,702	.....
22	Yachts.....	52	5,353	3,500	51	1	.....	.....	17,839	.....
23	Miscellaneous.....	81	19,771	13,209	79	2	.....	.....	24,395	.....
24	Motor.....	1,081	15,863	12,875	1,079	1	1	.....	.....	37,211
25	Freight and passenger.....	176	3,026	2,444	176	.....	.....	.....	5,749	.....
26	Tugs and other towing vessels.....	47	460	372	46	.....	1	.....	1,402	.....
27	Ferryboats.....	11	215	170	11	.....	.....	.....	346	.....
28	Fishing.....	397	3,760	3,303	397	.....	.....	.....	7,412	.....
29	Yachts.....	407	7,771	6,078	406	1	.....	.....	20,654	.....
30	Miscellaneous.....	43	631	508	43	.....	.....	.....	1,648	.....
31	Sail.....	162	145,450	137,087	.....	.....	.....	.....	.....	.....
32	Freight and passenger.....	119	144,657	136,372	.....	.....	.....	.....	.....	.....
33	Fishing.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
34	Yachts.....	42	495	432	.....	.....	.....	.....	.....	.....
35	Miscellaneous.....	1	298	283	.....	.....	.....	.....	.....	.....
36	Unrigged.....	857	181,611	168,189	.....	.....	.....	.....	.....	.....
37	Canal boats.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
38	All other unrigged.....	857	181,611	168,189	.....	.....	.....	.....	.....	.....
39	Mississippi River and its tributaries.....	7,247	1,621,587	1,583,186	611	79	1,017	1	189,326	30,293
40	Steam and motor.....	1,708	120,055	105,183	611	79	1,017	1	189,326	30,293
41	Freight and passenger.....	889	48,602	44,456	128	39	222	.....	61,507	6,783
42	Tugs and other towing vessels.....	736	49,865	42,338	159	10	667	.....	106,212	9,469
43	Ferryboats.....	213	11,263	9,951	44	22	146	1	12,142	2,543
44	Fishing.....	8	92	63	6	.....	2	.....	12	173
45	Yachts.....	325	6,429	4,906	267	6	52	.....	3,566	10,949
46	Miscellaneous.....	37	3,804	3,469	7	2	28	.....	5,887	376
47	Steam.....	636	103,115	91,023	105	51	479	1	189,326	.....
48	Freight and passenger.....	162	43,162	39,759	13	33	116	.....	61,507	.....
49	Tugs and other towing vessels.....	362	45,339	38,576	80	5	277	.....	106,212	.....
50	Ferryboats.....	71	9,155	8,087	5	11	54	1	12,142	.....
51	Fishing.....	1	10	7	1	.....	.....	.....	12	.....
52	Yachts.....	12	1,941	1,392	6	.....	6	.....	3,566	.....
53	Miscellaneous.....	28	3,508	3,202	.....	2	26	.....	5,887	.....
54	Motor.....	1,072	16,940	14,160	806	28	538	.....	.....	30,293
55	Freight and passenger.....	227	5,440	4,697	115	6	106	.....	6,783	.....
56	Tugs and other towing vessels.....	374	4,526	3,762	79	5	290	.....	9,469	.....
57	Ferryboats.....	142	2,108	1,864	39	11	92	.....	2,543	.....
58	Fishing.....	7	82	56	5	.....	2	.....	173	.....
59	Yachts.....	313	4,488	3,514	261	6	46	.....	10,949	.....
60	Miscellaneous.....	9	296	267	7	.....	2	.....	376	.....
61	Unrigged.....	5,539	1,501,532	1,478,003	.....	.....	.....	.....	.....	.....
62	Canal boats.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
63	All other unrigged.....	5,539	1,501,532	1,478,003	.....	.....	.....	.....	.....	.....
64	Canals and other inland waters of New York state.....	978	115,290	105,305	148	3	19	.....	12,687	2,504
65	Steam and motor.....	170	11,603	7,636	148	3	19	.....	12,687	2,504
66	Freight and passenger.....	70	8,586	5,596	59	2	9	.....	6,513	835
67	Tugs and other towing vessels.....	69	2,085	1,385	51	.....	8	.....	6,037	203
68	Ferryboats.....	3	66	45	2	1	.....	.....	163	.....
69	Yachts.....	32	671	458	31	.....	1	.....	1,087	1,003
70	Miscellaneous.....	6	195	152	5	.....	1	.....	50	300
71	Steam.....	119	10,103	6,568	102	2	15	.....	12,687	.....
72	Freight and passenger.....	56	7,848	6,057	47	2	7	.....	6,513	.....
73	Tugs and other towing vessels.....	53	2,015	1,328	45	.....	8	.....	6,037	.....
74	Yachts.....	8	195	145	8	.....	.....	.....	1,087	.....
75	Miscellaneous.....	2	45	38	2	.....	.....	.....	50	.....
76	Motor.....	51	1,500	1,068	46	1	4	.....	.....	2,504
77	Freight and passenger.....	14	738	539	12	.....	2	.....	835	.....
78	Tugs and other towing vessels.....	6	70	67	6	.....	.....	.....	203	.....
79	Ferryboats.....	3	66	46	2	1	.....	.....	163	.....
80	Yachts.....	24	476	313	23	.....	1	.....	1,003	.....
81	Miscellaneous.....	4	150	114	3	.....	1	.....	300	.....

PATION, AND DIVISION: 1916—Continued.

CONSTRUCTION.			Value of vessels.	INCOME.				EMPLOYEES ON VESSELS.		Number of passengers carried.	FREIGHT CARRIED (TONS OF 2,000 POUNDS).		
Metal.	Wood.	Composite.		Total.	Freight.	Passenger.	All other.	Number.	Wages.		Exclusive of lighterage.	Lighterage or harbor work.	
34	281	1	\$13,419,521	\$8,409,429	\$7,727,579		\$681,850	3,974	\$1,904,049		1,749,031		1
34	230		13,169,036	8,064,360	7,725,329		330,031	3,550	1,674,058		1,748,281		2
	20		159,860	343,569	2,250		341,319	412	215,841		750		3
	28	1	71,125					6	6,125				4
	3		19,500	1,500			1,500	6	8,025				5
22	1,651		8,063,288	5,294,152	2,687,035		2,607,117	1,514	1,134,551		4,744,377	3,102,327	6
22	1,651		8,063,288	5,294,152	2,687,035		2,607,117	1,514	1,134,551		4,744,377	3,102,327	8
867	2,562	33	175,956,392	87,225,376	70,382,512	\$6,881,689	9,961,175	28,680	19,582,781	19,249,692	125,385,545	6,088,046	9
725	1,690	28	163,447,221	81,634,794	67,563,927	6,881,689	7,189,178	25,970	17,976,903	19,249,692	122,442,208	3,227,187	10
517	373	20	151,018,091	75,235,575	67,551,432	6,190,830	1,493,313	21,022	14,520,632	5,923,306	122,439,866	1,067,434	11
99	200	2	3,602,554	2,523,183	500	2,095	2,520,588	1,404	1,187,304	6,805	150	900	12
11	32		874,675	718,215	5,917	684,180	28,118	312	186,745	13,290,770	689		13
35	569	2	1,190,866	2,129,489	5,173	2,084	2,121,632	1,807	949,562	18,011	1,503		14
29	428	2	4,167,500					660	356,698				15
34	88	2	2,593,475	1,028,332	905	1,900	1,025,527	765	775,962	10,800		2,158,853	16
705	633	24	160,533,324	80,455,254	67,475,839	6,745,437	6,233,978	24,502	17,323,290	18,319,876	122,396,430	3,145,904	17
516	199	19	150,694,478	75,001,244	67,464,452	6,072,032	1,464,760	20,757	14,438,201	5,231,864	122,394,454	992,114	18
98	154	2	3,513,445	2,458,159	500	1,600	2,456,059	1,354	1,163,248	4,815	150	900	19
10	22		842,225	705,323	5,917	671,505	27,901	294	181,474	13,081,997	689		20
33	176		825,643	1,335,195	4,065	300	1,330,830	1,070	657,516	1,200	1,137		21
19	32	1	2,178,295					334	173,721				22
29	50	2	2,479,238	955,333	905		954,428	693	709,130			2,152,890	23
20	1,057	4	2,913,897	1,179,540	88,088	136,252	955,200	1,468	653,613	929,816	45,778	81,283	24
1	174	1	323,613	234,331	86,980	118,798	28,553	265	82,431	691,442	45,412	75,320	25
1	46		89,109	65,024		495	64,529	50	24,056	1,990			26
1	10		32,450	12,892		12,675	217	18	6,271	208,773			27
2	393	2	365,223	794,294	1,108	2,384	790,802	737	292,046	16,811	366		28
10	396	1	1,989,265					326	182,977				29
5	38		114,237	72,999		1,900	71,099	72	66,832	10,800		5,963	30
25	137		4,351,287	1,611,810	1,592,510		19,300	878	464,581		1,730,990	33,700	31
25	94		4,278,137	1,603,310	1,592,510		10,800	856	456,096		1,730,990	7,150	32
	42		70,160					17	5,425				33
	1		3,000	8,500			8,500	5	3,060			26,550	34
117	735	5	8,157,884	3,978,772	1,226,075		2,752,697	1,832	1,141,297		1,212,347	2,827,159	35
117	735	5	8,157,884	3,978,772	1,226,075		2,752,697	1,832	1,141,297		1,212,347	2,827,159	36
411	6,804	32	23,044,903	17,465,856	5,671,446	2,404,703	9,389,707	14,732	6,396,552	17,599,378	27,962,583	12,206,844	37
132	1,562	14	13,157,454	11,528,782	3,488,625	2,319,071	5,721,086	12,535	5,107,908	16,599,431	7,992,998		38
30	358	8	4,531,749	5,312,501	3,459,646	1,643,781	209,074	4,091	2,123,755	4,084,851	7,982,683		39
60	668	8	5,917,111	4,011,644	28,979	43,772	3,938,893	7,361	2,301,009	119,870	10,315		40
18	192	3	1,014,950	1,060,470		631,113	423,357	572	346,116	12,390,740			41
	8		14,400	26,110			26,110	26	16,227				42
20	304	1	1,206,153	11,058		405	10,653	173	98,399	970			43
4	32	1	473,091	1,106,999			1,106,999	312	222,402				44
84	543	9	10,870,444	10,141,656	3,128,125	2,025,548	4,987,983	10,967	4,475,922	14,513,147	7,752,419		45
16	145	6	3,864,783	4,736,987	3,104,037	1,466,502	166,448	3,565	1,916,493	3,279,819	7,746,169		46
51	305	1	5,377,020	3,460,427	24,088	33,995	3,402,344	6,646	2,042,137	77,328	6,250		47
11	59	1	815,650	853,763		525,051	328,712	394	272,241	11,156,000			48
	3		1,500	2,050			2,050	1	200				49
	9		369,500	3,500			3,500	74	34,399				50
3	24	1	441,991	1,264,929			1,084,929	287	210,452				51
48	1,019	5	2,287,010	1,387,125	360,500	293,523	733,103	1,568	631,986	2,083,284	240,579		52
14	213		666,966	675,514	355,609	177,279	42,626	526	207,262	805,032	236,514		53
9	363	2	540,091	551,217	4,891	9,777	536,549	715	258,872	42,542	4,065		54
7	133	2	199,300	206,707		106,062	100,645	178	73,875	1,234,740			55
	7		12,900	24,060			24,060	25	16,027				56
17	295	1	836,653	7,558		405	7,153	99	64,000	970			57
1	8		31,100	22,070			22,070	25	11,950				58
279	5,242	18	9,887,449	5,937,074	2,182,821	85,632	3,668,621	2,197	1,288,644	1,002,947	19,969,585	12,206,844	59
279	5,242	18	9,887,449	5,937,074	2,182,821	85,632	3,668,621	2,197	1,288,644	1,002,947	19,969,585	12,206,844	60
19	955	4	2,857,239	2,138,557	1,146,162	145,509	846,886	1,490	590,788	457,351	1,120,762	296,982	61
18	148	4	1,291,796	500,634	97,507	144,709	258,418	533	195,163	449,351	78,352	2,250	62
6	62	2	814,381	280,338	97,507	142,138	40,693	309	402,839		78,352	2,250	63
10	49		274,265	195,973			195,973	174	81,324				64
	3		12,500	18,331		2,571	15,760	8	3,593	46,512			65
1	29	2	159,450					34	11,866				66
1	5		31,200	5,992			5,992	8	3,850				67
13	104	2	1,040,286	449,414	86,061	134,827	228,526	466	174,173	376,781	76,518	2,250	68
3	51	2	724,336	261,233	86,061	134,827	40,345	283	88,034	376,781	76,518	2,250	69
10	43		263,500	167,266			187,266	167	78,474				70
	8		50,000					15	6,915				71
	2		2,450	915			915	1	750				72
5	44	2	251,510	51,220	11,446	9,882	29,892	67	20,990	72,570	1,834		73
3	11		90,045	19,105	11,446	7,311	348	26	6,496	26,058	1,834		74
	6		10,765				8,707	7	2,850				75
	3		12,500	18,331		2,571	15,760	8	3,593	46,512			76
1	21	2	109,450					19	4,951				77
1	8		28,750	5,077			5,077	7	3,100				78

TRANSPORTATION BY WATER.

TABLE 69.—ALL VESSELS, BY CLASS, OCCU-

	CLASS, OCCUPATION, AND DIVISION.	Number of vessels.	TONNAGE.		RIGGED.				HORSEPOWER OF ENGINES.	
			Gross.	Net.	Screw.	Side wheel.	Stern wheel.	All other.	Steam.	Gasoline.
	Canals and other inland waters of New York state— Continued.									
1	Sail.....	4	150	140						
2	Freight and passenger.....	1	30	25						
3	Yachts.....	3	120	115						
4	Unrigged.....	804	103,537	97,529						
5	Canal boats.....	651	84,696	79,167						
6	All other unrigged.....	153	18,841	18,362						
7	All other inland waters.....	1,074	81,172	70,905	319	11	77		22,473	5,476
8	Steam and motor.....	407	16,289	10,853	319	11	77		22,473	5,476
9	Freight and passenger.....	190	10,360	6,804	159	4	27		15,591	2,861
10	Tugs and other towing vessels.....	95	3,873	2,538	70	5	20		5,896	350
11	Ferryboats.....	14	437	363	6	2	6		214	209
12	Fishing.....	3	36	29	3					55
13	Yachts.....	89	1,213	893	79		10		574	1,954
14	Miscellaneous.....	16	370	226	2		14		198	47
15	Steam.....	221	13,804	8,932	164	10	47		22,473	
16	Freight and passenger.....	107	9,220	5,921	92	4	11		15,691	
17	Tugs and other towing vessels.....	85	3,747	2,438	61	5	19		5,896	
18	Ferryboats.....	6	278	226	2	1	3		214	
19	Yachts.....	11	259	171	9		2		574	
20	Miscellaneous.....	12	300	176			12		198	
21	Motor.....	186	2,485	1,921	155	1	30			5,476
22	Freight and passenger.....	83	1,140	883	67		16			2,861
23	Tugs and other towing vessels.....	10	126	100	9		1			350
24	Ferryboats.....	8	159	137	4	1	3			209
25	Fishing.....	3	36	29	3					55
26	Yachts.....	78	954	722	70		8			1,954
27	Miscellaneous.....	4	70	50	2		2			47
28	Sail.....	1	108	101						
29	Freight and passenger.....	1	108	101						
30	Unrigged.....	668	64,775	59,951						
31	Canal boats.....	405	49,694	46,003						
32	All other unrigged.....	261	15,081	13,948						

PATION, AND DIVISION: 1916—Continued.

CONSTRUCTION.			Value of vessels.	INCOME.				EMPLOYEES ON VESSELS.		Number of passengers carried.	FREIGHT CARRIED (TONS OF 2,000 POUNDS).		
Metal.	Wood.	Com- posite.		Total.	Freight.	Passenger.	All other.	Num- ber.	Wages.		Exclusive of lighterage.	Lighterage or harbor work.	
	4		\$7,150	\$550	\$550			3	\$1,100		770		1
	1		200	550	550			1	100		770		2
	3		6,950					2	1,000				3
1	803		1,558,293	1,637,373	1,048,105	\$800	\$588,468	954	394,525	8,000	1,041,640	294,732	4
	651		974,095	1,093,554	1,027,814		65,740	618	223,401		989,740	242,180	5
1	152		584,198	543,819	20,291	800	522,728	336	171,124	8,000	51,900	52,552	6
25	1,040	9	2,890,847	2,053,766	858,027	482,583	713,156	1,684	678,107	1,547,685	1,421,864	219,871	7
19	379	9	2,069,490	1,065,706	197,029	482,502	385,275	984	398,437	1,544,885	118,717		8
14	168	8	1,406,546	693,437	161,176	464,687	67,574	596	213,719	1,420,972	89,179		9
3	91	1	407,425	301,973	27,891		274,082	294	146,918		29,147		10
1	13		52,250	39,848	8,837	17,720	13,291	16	9,476	123,656	381		11
	3		3,600	12,842			12,842	6	5,010				12
1	88		183,819	1,010	25	95	800	38	13,260	257	10		13
	16		15,850	16,596			16,596	34	10,054				14
17	195	9	1,712,397	903,858	170,227	398,411	335,220	825	343,966	1,270,008	109,326		15
12	87	8	1,247,372	576,059	134,499	387,540	54,020	499	182,979	1,161,918	80,133		16
3	81	1	382,525	289,836	27,891		261,945	281	141,491		29,147		17
1	5		34,850	21,767	7,837	10,871	3,059	10	6,857	108,090	46		18
1	10		35,100					10	3,970				19
	12		12,550	16,196			16,196	25	8,669				20
2	184		357,093	161,848	27,702	84,091	50,055	159	54,471	274,877	9,391		21
2	81		159,174	117,378	26,677	77,147	13,554	97	30,740	259,054	9,046		22
	10		24,900	12,137			12,137	13	5,427				23
	8		17,400	18,081	1,000	6,849	10,232	6	2,619	15,566	835		24
	3		3,600	12,842			12,842	6	5,010				25
	78		148,719	1,010	25	95	800	28	9,290	257	10		26
	4		3,300	400			400	9	1,385				27
	1		1,500	600	600			2	180		1,150		28
	1		1,500	600	600			2	180		1,150		29
6	660		819,857	987,460	659,498	81	327,881	698	279,490	2,800	1,301,997	219,871	30
	405		314,220	491,727	485,989		5,738	439	108,649		837,791	40,000	31
6	255		505,637	495,733	173,509	81	322,143	259	170,841	2,800	494,206	179,871	32

TRANSPORTATION BY WATER.

TABLE 70.—ALL VESSELS, BY CLASS, OWNERSHIP, AND DIVISION: 1916.

CLASS, OWNERSHIP, AND DIVISION.	Number of vessels.	Gross tonnage.	CONSTRUCTION.			Value of vessels.	Gross income.	EMPLOYEES ON VESSELS.		Number of passengers carried.
			Metal.	Wood.	Composite. ¹			Number.	Wages.	
Aggregate.....	43,110	12,395,236	3,370	39,619	121	\$979,388,633	\$589,124,887	179,278	\$115,110,891	331,608,614
Individual.....	16,436	1,262,136	342	16,045	49	78,953,753	41,603,571	36,060	17,386,852	10,644,870
Firm.....	4,247	572,013	86	4,153	8	23,535,842	22,417,573	11,698	7,003,368	2,695,938
Incorporated company.....	21,791	10,451,023	2,861	18,868	62	863,823,482	521,165,117	127,535	87,558,362	291,503,129
All other.....	636	110,064	81	553	2	13,075,556	3,938,626	3,383	3,162,309	26,764,677
Steam and motor.....	18,059	6,194,243	2,531	15,441	87	818,065,866	464,331,090	132,965	89,358,051	330,454,460
Individual.....	9,442	288,831	289	9,123	30	55,140,474	21,941,534	22,838	11,730,913	10,158,808
Firm.....	1,802	54,108	64	1,736	2	9,893,168	9,498,046	6,453	4,028,077	2,621,154
Incorporated company.....	6,507	5,777,486	2,100	4,354	53	743,403,867	430,961,757	101,382	71,138,698	291,023,421
All other.....	308	49,518	78	228	2	9,628,357	1,929,753	2,292	2,460,363	26,651,077
Steam.....	6,532	5,943,388	2,362	4,101	69	772,054,054	440,561,053	108,786	77,103,632	321,770,485
Individual.....	1,216	153,326	209	994	13	29,560,693	10,511,325	8,937	5,487,944	5,874,334
Firm.....	511	54,102	46	463	2	6,590,706	5,895,934	3,266	2,287,541	1,968,937
Incorporated company.....	4,633	5,691,775	2,040	2,546	52	727,690,925	422,354,207	94,821	67,450,404	287,556,914
All other.....	167	44,185	67	98	2	8,211,730	1,829,587	1,762	1,877,743	26,764,677
Motor.....	11,527	250,855	169	11,340	18	46,011,812	23,770,037	24,179	12,254,419	8,683,975
Individual.....	8,226	135,505	80	8,129	17	25,579,781	11,430,209	13,901	6,242,969	4,284,474
Firm.....	1,291	24,006	18	1,273	.....	3,302,462	3,632,112	3,187	1,740,536	652,217
Incorporated company.....	1,869	85,711	60	1,808	1	15,712,942	8,607,550	6,561	3,688,294	3,466,507
All other.....	141	5,633	11	130	.....	1,416,627	100,166	530	582,620	280,777
Sail.....	4,740	1,219,739	157	4,573	10	64,103,007	45,842,898	23,529	10,882,997	867
Individual.....	2,989	250,661	23	2,957	9	13,472,737	11,379,011	10,372	3,895,584	537
Firm.....	638	149,832	3	634	1	6,581,622	7,378,448	3,177	1,812,710	320
Incorporated company.....	1,045	796,599	131	914	.....	42,820,662	26,006,557	9,430	4,811,451	10
All other.....	68	22,647	.....	68	.....	1,227,986	1,078,822	550	363,222	.....
Unrigged.....	20,311	4,981,254	682	19,605	24	97,219,760	78,950,899	22,782	14,869,843	1,153,287
Individual.....	4,005	722,644	30	3,965	10	10,340,542	8,283,026	3,450	1,760,355	485,525
Firm.....	1,807	344,073	19	1,783	5	7,061,052	5,541,079	2,068	1,162,581	74,464
Incorporated company.....	14,239	3,876,938	630	13,600	9	77,598,953	64,106,803	16,723	11,608,183	479,698
All other.....	260	37,599	3	257	.....	2,219,213	929,991	541	338,724	113,600
Atlantic coast and Gulf of Mexico.....	25,387	6,614,197	1,791	23,557	39	642,114,328	395,211,148	104,224	67,378,700	237,345,627
Individual.....	10,859	829,545	211	10,626	22	56,434,831	27,625,759	25,748	11,836,082	4,467,341
Firm.....	2,633	454,926	37	2,595	1	16,524,600	16,210,110	7,812	4,744,621	858,716
Incorporated company.....	11,515	5,249,722	1,490	10,009	16	560,503,594	348,729,530	68,536	48,756,414	208,588,394
All other.....	380	80,004	53	327	.....	8,651,303	2,645,749	2,128	2,041,583	23,931,176
Steam and motor.....	10,358	2,890,009	1,436	8,893	29	527,057,790	298,274,571	69,965	48,234,277	237,205,220
Individual.....	5,940	170,933	178	5,748	14	37,648,812	12,081,183	14,019	7,173,139	4,466,804
Firm.....	930	31,520	25	905	.....	4,682,536	4,682,040	3,297	2,147,996	358,396
Incorporated company.....	3,295	2,649,285	1,180	2,100	15	477,717,020	279,968,636	51,034	37,203,879	208,448,844
All other.....	193	38,271	53	140	.....	7,009,422	1,592,703	1,615	1,709,263	23,931,176
Steam.....	3,396	2,734,189	1,357	2,017	22	498,229,447	285,024,224	55,451	40,974,721	234,491,468
Individual.....	629	82,433	143	479	7	20,183,664	5,478,134	5,123	3,326,863	3,097,480
Firm.....	226	18,797	21	205	.....	2,927,959	2,419,777	1,367	1,040,830	244,653
Incorporated company.....	2,437	2,698,480	1,149	1,273	15	469,258,072	275,594,226	47,770	35,396,801	207,237,129
All other.....	104	34,479	44	60	.....	5,859,752	1,532,087	1,191	1,210,227	23,912,206
Motor.....	6,962	155,820	79	6,876	7	28,828,343	13,250,347	14,514	7,259,556	2,713,752
Individual.....	5,311	88,500	35	5,269	7	17,465,148	6,603,049	8,896	3,846,276	1,369,324
Firm.....	704	12,723	4	700	.....	1,754,577	2,212,272	1,930	1,077,166	113,743
Incorporated company.....	858	50,805	31	827	.....	8,458,948	4,374,410	3,264	1,807,078	1,211,715
All other.....	89	3,792	9	80	.....	1,149,670	60,616	424	499,036	18,970
Sail.....	4,257	847,950	98	4,150	9	46,323,549	35,820,509	18,672	8,513,087	867
Individual.....	2,796	203,549	21	2,767	8	11,410,462	9,641,400	9,523	3,441,453	537
Firm.....	600	138,770	3	596	1	6,151,622	6,902,194	2,974	1,678,019	320
Incorporated company.....	804	489,966	74	730	.....	27,903,479	18,485,597	5,731	3,105,257	10
All other.....	57	15,635	.....	57	.....	857,986	751,318	444	288,358	.....
Unrigged.....	10,772	2,876,238	257	10,514	1	68,732,989	61,116,068	15,587	10,631,336	139,540
Individual.....	2,123	455,063	12	2,111	.....	7,375,557	5,863,176	2,206	1,221,490	.....
Firm.....	1,103	284,636	9	1,094	.....	5,690,442	4,675,867	1,541	918,606	.....
Incorporated company.....	7,416	2,110,441	236	7,179	1	54,883,095	50,275,297	11,771	8,447,278	139,540
All other.....	130	26,098	.....	130	.....	783,895	301,728	69	43,962	.....
Pacific coast (including Alaska).....	4,962	1,215,303	257	4,701	4	132,524,924	85,030,184	28,466	20,483,963	55,408,881
Individual.....	1,578	82,869	10	1,567	1	8,903,828	6,141,862	4,458	2,538,696	947,617
Firm.....	417	33,497	3	414	.....	3,472,065	2,794,644	1,359	983,842	295,368
Incorporated company.....	2,904	1,081,793	237	2,665	2	117,802,955	75,247,558	22,105	16,465,965	51,566,805
All other.....	63	17,144	7	55	1	2,346,076	846,090	544	495,489	2,599,091
Steam and motor.....	2,973	735,661	201	2,769	3	111,042,115	71,326,603	22,978	17,445,363	55,408,881
Individual.....	1,295	363,625	8	1,287	.....	6,863,293	4,693,443	3,746	2,137,074	947,617
Firm.....	262	17,036	3	259	.....	2,596,305	2,305,085	1,130	846,207	295,368
Incorporated company.....	1,384	674,133	185	1,197	2	100,547,990	64,105,110	17,871	14,198,606	51,566,805
All other.....	32	5,867	5	26	1	1,034,527	222,965	231	263,576	2,599,091
Steam.....	798	677,414	186	609	3	99,668,156	63,586,647	16,575	13,811,560	52,799,205
Individual.....	68	15,820	7	61	.....	2,923,037	1,456,937	721	544,077	170,628
Firm.....	35	10,389	2	33	.....	1,602,200	1,376,861	353	386,409	182,302
Incorporated company.....	678	646,602	172	504	2	94,253,717	60,554,906	15,289	12,643,488	49,989,881
All other.....	17	4,794	5	11	1	889,202	197,943	197	237,586	2,456,394
Motor.....	2,175	58,247	15	2,160	.....	11,373,959	7,739,956	6,403	3,633,803	2,609,676
Individual.....	1,227	22,966	1	1,226	.....	3,940,256	3,236,056	3,025	1,592,997	776,989
Firm.....	227	6,647	1	226	.....	994,105	928,224	772	450,793	113,066
Incorporated company.....	706	27,531	13	693	.....	6,294,273	3,550,204	2,572	1,555,018	1,576,924
All other.....	15	1,073	.....	15	.....	145,325	25,022	34	25,990	142,697

¹ Includes one concrete scow.

TABLE 70.—ALL VESSELS, BY CLASS, OWNERSHIP, AND DIVISION: 1916—Continued.

CLASS, OWNERSHIP, AND DIVISION.	Number of vessels.	Gross tonnage.	CONSTRUCTION.			Value of vessels.	Gross income.	EMPLOYEES ON VESSELS.		Number of passengers carried.
			Metal.	Wood.	Composite.			Number.	Wages.	
Pacific coast (including Alaska)—Continued.										
Sail.....	316	226,081	34	281	1	\$13,419,521	\$8,409,429	3,974	\$1,904,049	.....
Individual.....	113	32,452	2	110	1	1,783,725	1,292,966	635	350,974	.....
Firm.....	26	8,508	.....	26	.....	890,000	382,665	157	107,656	.....
Incorporated company.....	166	178,109	32	134	.....	10,875,796	6,406,244	3,076	1,370,555	.....
All other.....	11	7,012	.....	11	.....	370,000	327,564	106	74,864	.....
Unrigged.....	1,673	253,561	22	1,651	.....	8,063,288	5,294,152	1,614	1,134,551	.....
Individual.....	170	11,792	.....	170	.....	256,810	155,463	77	50,648	.....
Firm.....	129	7,953	.....	129	.....	485,760	106,894	72	29,979	.....
Incorporated company.....	1,354	229,551	20	1,334	.....	6,379,169	4,736,234	1,158	896,875	.....
All other.....	26	4,265	2	18	.....	941,549	295,561	207	157,049	.....
Great Lakes and St. Lawrence River.....	3,462	2,747,687	867	2,562	33	175,956,392	87,225,376	28,680	19,582,781	19,249,692
Individual.....	1,218	79,544	57	1,155	6	7,520,788	3,217,561	2,993	1,494,218	1,632,913
Firm.....	362	25,430	23	338	1	1,636,755	1,852,290	1,221	707,646	538,756
Incorporated company.....	1,829	2,637,024	771	1,033	25	165,379,238	81,991,310	24,082	16,946,234	17,066,723
All other.....	53	5,689	16	36	1	1,419,611	164,215	384	431,693	11,300
Steam and motor.....	2,443	2,420,626	725	1,690	28	163,447,221	81,634,794	25,970	17,976,903	19,249,692
Individual.....	1,061	48,306	52	1,003	6	6,917,220	2,492,948	2,549	1,287,026	1,632,913
Firm.....	303	19,400	22	280	1	1,477,250	1,649,259	1,086	643,585	538,756
Incorporated company.....	1,041	2,349,239	636	385	20	153,783,309	77,445,662	22,027	15,613,828	17,066,723
All other.....	38	3,681	15	22	1	1,269,442	46,925	308	402,464	11,300
Steam.....	1,362	2,404,763	705	633	24	160,533,324	80,455,254	24,502	17,323,290	18,319,876
Individual.....	252	36,235	38	211	3	4,481,405	1,772,800	1,524	858,105	888,909
Firm.....	150	17,565	19	130	1	1,250,140	1,418,446	890	562,717	478,136
Incorporated company.....	937	2,347,536	633	285	19	153,572,669	77,222,323	21,819	15,536,294	16,952,331
All other.....	23	3,427	15	7	1	1,229,110	41,685	269	366,114	500
Motor.....	1,081	15,863	20	1,057	4	2,913,897	1,179,540	1,468	653,613	929,816
Individual.....	809	12,071	14	792	3	2,435,815	720,148	1,025	428,861	744,004
Firm.....	153	1,835	3	150	.....	227,110	230,813	196	80,868	60,620
Incorporated company.....	104	1,703	3	100	1	210,640	223,339	208	107,534	114,392
All other.....	15	254	.....	15	.....	40,332	5,240	39	36,350	10,800
Sail.....	162	145,450	25	137	.....	4,351,287	1,611,810	878	464,581	.....
Individual.....	75	14,402	.....	75	.....	269,900	403,505	209	101,877	.....
Firm.....	12	2,554	.....	12	.....	40,000	93,589	46	27,035	.....
Incorporated company.....	75	128,494	25	50	.....	4,041,387	1,114,716	623	335,669	.....
Unrigged.....	857	181,611	117	735	5	8,157,884	3,978,772	1,832	1,141,297	.....
Individual.....	82	16,836	5	77	.....	333,668	321,108	235	105,315	.....
Firm.....	47	3,476	1	46	.....	119,505	109,442	89	37,026	.....
Incorporated company.....	713	159,291	110	598	5	7,554,542	3,430,932	1,432	966,737	.....
All other.....	15	2,008	1	14	.....	150,169	117,290	76	32,219	.....
Mississippi River and its tributaries.....	7,247	1,621,587	411	6,804	32	23,044,903	17,465,856	14,732	6,396,552	17,599,378
Individual.....	1,858	182,148	51	1,789	18	4,349,914	3,334,951	2,531	1,179,273	3,236,303
Firm.....	618	46,446	22	590	6	1,558,622	1,297,318	1,108	495,310	1,435,038
Incorporated company.....	4,731	1,390,915	334	4,389	8	16,704,919	12,713,863	10,953	4,629,216	12,710,127
All other.....	40	2,078	4	36	.....	431,448	119,724	140	92,753	217,910
Steam and motor.....	1,708	120,055	132	1,562	14	13,157,454	11,523,782	12,535	5,107,908	16,596,431
Individual.....	867	23,016	41	818	8	2,942,465	2,353,685	2,126	953,640	2,761,578
Firm.....	247	8,856	13	233	1	1,022,727	811,440	837	351,544	1,360,574
Incorporated company.....	573	86,949	74	494	5	8,979,104	8,315,780	9,506	3,721,311	12,369,969
All other.....	21	1,234	4	17	.....	213,158	17,877	66	51,413	104,310
Steam.....	636	103,115	84	543	9	10,870,444	10,141,656	10,967	4,475,922	14,513,147
Individual.....	151	13,332	12	136	3	1,562,137	1,584,870	1,284	645,957	1,572,038
Firm.....	72	6,486	4	67	1	752,757	590,350	583	269,905	1,046,454
Incorporated company.....	408	82,372	66	337	5	8,391,942	7,953,748	9,054	3,524,626	11,894,655
All other.....	5	925	2	3	.....	163,608	12,688	46	35,434	.....
Motor.....	1,072	16,940	48	1,019	5	2,287,010	1,387,126	1,568	631,986	2,083,284
Individual.....	716	9,684	29	682	5	1,380,328	768,815	842	337,683	1,189,540
Firm.....	175	2,370	9	166	.....	269,970	221,090	254	81,633	314,120
Incorporated company.....	165	4,577	8	157	.....	587,162	392,032	432	196,685	475,314
All other.....	16	309	2	14	.....	49,550	5,189	20	15,979	104,310
Unrigged.....	5,539	1,501,532	279	5,242	18	9,887,449	5,937,074	2,197	1,288,644	1,002,947
Individual.....	991	159,132	10	971	10	1,407,449	981,266	405	195,633	474,725
Firm.....	371	37,590	9	357	5	535,895	485,878	271	143,766	74,464
Incorporated company.....	4,158	1,303,966	260	3,895	3	7,725,815	4,368,083	1,447	907,905	340,158
All other.....	19	844	.....	19	.....	218,290	101,847	74	41,340	113,600
Canals and other inland waters of New York state.....	978	115,290	19	955	4	2,857,239	2,138,557	1,490	590,788	457,351
Individual.....	642	74,727	8	632	2	1,194,398	1,035,008	651	240,877	68,612
Firm.....	41	4,764	1	40	.....	195,200	87,829	58	17,936	1,050
Incorporated company.....	218	31,417	10	206	2	1,337,631	938,287	667	264,829	387,689
All other.....	77	4,382	.....	77	.....	129,010	77,433	114	67,146	.....
Steam and motor.....	170	11,603	18	148	4	1,291,796	500,634	533	195,163	449,351
Individual.....	94	4,344	8	84	2	383,265	154,355	210	81,996	60,612
Firm.....	9	180	1	8	.....	20,500	23,519	23	10,500	1,050
Incorporated company.....	53	6,582	9	42	2	829,331	297,187	265	81,390	387,689
All other.....	14	497	.....	14	.....	58,700	25,573	35	21,277	.....
Steam.....	119	10,103	13	104	2	1,040,286	449,414	466	174,173	376,781
Individual.....	62	3,746	7	55	.....	253,550	130,117	180	71,852	13,600
Firm.....	5	125	.....	5	.....	11,500	17,825	16	8,485	.....
Incorporated company.....	41	5,873	6	33	2	742,286	279,476	241	74,959	363,181
All other.....	11	359	.....	11	.....	32,950	21,996	29	18,877	.....
Motor.....	51	1,500	5	44	2	251,510	51,220	67	20,990	72,570
Individual.....	32	598	1	29	2	129,715	24,238	30	10,144	47,012
Firm.....	4	55	1	3	.....	9,000	5,694	7	2,015	1,050
Incorporated company.....	12	709	3	9	.....	87,015	17,711	24	6,431	24,508
All other.....	3	138	.....	3	.....	25,750	3,577	6	2,400	.....

TABLE 70.—ALL VESSELS, BY CLASS, OWNERSHIP, AND DIVISION: 1916—Continued.

CLASS, OWNERSHIP, AND DIVISION.	Number of vessels.	Gross tonnage.	CONSTRUCTION.			Value of vessels.	Gross income.	EMPLOYEES ON VESSELS.		Number of passengers carried.
			Metal.	Wood.	Composite.			Number.	Wages.	
Canals and other inland waters of New York state—Continued.										
Sail.....	4	150		4		\$7,150	\$550	3	\$1,100	
Individual.....	4	150		4		7,150	550	3	1,100	
Unrigged.....	804	103,537	1	803		1,558,293	1,637,373	954	394,525	8,000
Individual.....	544	70,233		544		803,983	880,103	438	157,781	8,000
Firm.....	32	4,584		32		175,700	64,310	35	7,436	
Incorporated company.....	165	24,835	1	164		508,300	641,100	402	183,439	
All other.....	63	3,885		63		70,310	51,860	79	45,869	
All other inland waters.....	1,074	81,172	25	1,040	9	2,890,847	2,053,766	1,684	678,107	1,547,685
Individual.....	231	13,303	5	276		549,994	248,430	279	97,705	292,084
Firm.....	176	6,950		176		147,600	175,382	140	54,013	67,010
Incorporated company.....	594	60,152	19	566	9	2,095,145	1,544,539	1,192	495,733	1,183,391
All other.....	23	767	1	22		98,108	85,415	73	30,655	5,200
Steam and motor.....	407	16,289	19	379	9	2,069,490	1,065,705	984	398,437	1,544,885
Individual.....	185	3,607	2	183		885,419	165,920	188	68,038	289,284
Firm.....	51	1,116		51		93,850	76,694	80	28,245	67,010
Incorporated company.....	161	11,298	16	136	9	1,547,113	799,382	679	289,784	1,183,391
All other.....	10	268	1	9		43,108	23,710	37	12,370	5,200
Steam.....	221	13,804	17	195	9	1,712,397	903,858	825	343,966	1,270,008
Individual.....	54	1,951	2	52		156,900	88,467	105	41,030	131,679
Firm.....	23	740		23		46,150	42,675	52	19,195	17,392
Incorporated company.....	137	10,912	14	114	9	1,472,239	749,528	638	274,236	1,119,737
All other.....	7	201	1	6		37,108	23,188	30	9,505	1,200
Motor.....	186	2,485	2	184		357,093	161,848	159	54,471	274,877
Individual.....	131	1,656		131		228,519	77,453	83	27,008	157,605
Firm.....	28	376		28		47,700	34,019	28	9,050	49,618
Incorporated company.....	24	386	2	22		74,874	49,854	41	15,548	63,654
All other.....	3	67		3		6,000	522	7	2,865	4,000
Sail.....	1	108		1		1,500	600	2	180	
Individual.....	1	108		1		1,500	600	2	180	
Unrigged.....	666	54,775	6	660		819,857	987,460	698	279,490	2,800
Individual.....	95	9,588	3	92		163,075	81,910	89	29,488	2,800
Firm.....	125	5,834		125		53,750	98,688	60	25,768	
Incorporated company.....	433	48,854	3	430		548,032	745,157	513	205,949	
All other.....	13	499		13		55,000	61,705	36	18,285	

ATLANTIC COAST
AND GULF OF MEXICO

ATLANTIC COAST AND GULF OF MEXICO.

By FREDERIC G. SWETT.

SCOPE OF THE REPORT.

This section of the report on water transportation covers statistics relating primarily to vessels engaged in the maritime commerce of the ports of the Atlantic coast and the Gulf of Mexico. The general report on water transportation by American owned craft for the United States has been divided into five geographic divisions. The vessels reported as employed in the coastwise and foreign commerce of the Atlantic coast and Gulf of Mexico division represented 57.2 per cent of the total number of vessels reported for the country as a whole, 53.1 per cent of the total gross tonnage, and 65.5 per cent of their total value.

USES OF THE WORDS "TON" AND "TONNAGE."

In the tables and in the discussion which follow, the word *tonnage* is used frequently and, of necessity, with different meanings. As a rule in this report the capacity of vessels is expressed in gross tonnage; a few references, however, are made to net tonnage. It will be understood that the gross register tonnage of a vessel is obtained by dividing the number of cubic feet in the capacity of the ship by 100, since a vessel has 1 gross ton for each 100 cubic feet capacity. The net register tonnage is obtained by dividing by 100 the capacity in cubic feet of the space available for cargo and passengers, this space being found by deducting from the entire capacity of the ship the space occupied by machinery, by accommodations for the crew, and by certain other housings which are carefully designated by law.

Freight charges on coastwise traffic are generally based on the 100-pound basis, although for a part of our coastwise commerce rates are based upon other quantity units, such as barrels, bushels, and bales, and not upon the hundredweight or ton. In the case of pig iron, steel rails, coal, and most other commodities of like nature, the freight rates are on a per ton basis of 2,240 pounds. There are some few exceptions, as, for instance, in the rates on clay, where a ton of 2,000 pounds is understood to apply. There are other cases where freight rates are based on so much per package, as, for instance, oil in barrels, fruits and vegetables, etc.; in the case of lumber, freight rates are based on so much per 1,000 feet. Aside from such special cases, however, the general basis is per 100 pounds, this basis applying to almost everything which is usually classed under the head of "general merchandise." In the tables of this report, however, all commodities shown by tons are based on the net ton of 2,000 pounds.

THE ATLANTIC AND GULF COAST FLEET.

In Table 1, which follows, are presented in a summarized form the principal facts regarding American owned vessels employed in the coastwise and foreign commerce of the Atlantic and Gulf coasts of the United States for the years 1916, 1906, and 1889, for all classes of craft of 5 tons net register or over. Percentages of increase or decrease, based on the figures in Table 1, are shown in Table 2.

TABLE 1.—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916, 1906, AND 1889.

	TOTAL.			STEAM. ¹			SAIL. ²			UNRIGGED.		
	1916	1906	1889	1916	1906	1889 ³	1916	1906	1889 ³	1916	1906	1889
Number of vessels.....	21,658	20,032	412,238	8,347	5,413	2,536	2,539	5,920	6,277	10,772	8,699	3,425
Gross tonnage.....	6,508,617	4,851,421	2,658,445	2,828,953	1,457,894	741,770	803,426	1,132,905	1,293,192	2,876,238	2,260,622	623,483
Value of vessels.....	\$629,074,203	\$273,105,915	\$116,042,062	\$517,410,317	\$193,926,327	\$65,518,640	\$42,930,897	\$37,520,903	\$42,685,982	\$68,732,989	\$41,658,685	\$7,837,440
Gross income.....	\$376,806,060	\$159,759,924	\$90,147,632	\$346,987,152	\$139,717,909	\$57,034,216	\$29,818,908	\$20,042,015	\$33,113,416	(⁴)	(⁴)	(⁴)
Number employed on vessels.....	84,978	77,124	63,625	575,386	558,470	530,528	9,592	18,654	33,097	(⁴)	(⁴)	(⁴)
Wages.....	\$58,902,964	\$38,352,259	\$22,123,099	\$53,660,412	\$31,664,945	\$13,284,325	\$5,242,552	\$6,687,314	\$8,838,774	(⁴)	(⁴)	(⁴)
Number of passengers carried.....	237,345,627	292,555,416	170,225,458	237,344,760	292,533,288	170,225,458	867	22,128	.....	(⁴)	(⁴)	(⁴)
Freight and harbor work (tons of 2,000 pounds).....	181,526,448	140,512,043	52,712,124	168,163,990	121,502,757	(⁴)	13,362,458	19,009,286	(⁴)	(⁴)	(⁴)	(⁴)
Freight carried.....	80,259,375	65,360,958	(⁴)	66,958,557	(⁴)	(⁴)	13,300,818	(⁴)	(⁴)	(⁴)	(⁴)	(⁴)
Harbor work.....	101,267,073	75,151,085	(⁴)	101,205,433	(⁴)	(⁴)	61,640	(⁴)	(⁴)	(⁴)	(⁴)	(⁴)

¹ Includes craft propelled by machinery.

² Includes schooner barges, scow schooners, etc., when fitted with sails.

³ Does not include employees or wages for yachts.

⁴ Includes 52 craft, with a gross tonnage of 2,553, valued at \$75,360, for which no report was made for income, employees, wages, number of passengers, and freight carried.

⁵ Includes statistics for unriggered craft.

⁶ Included in statistics for steam vessels.

⁷ Figures not available.

TABLE 2.—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS, PER CENT OF INCREASE: 1889-1916 AND 1906-1916.

	PER CENT OF INCREASE. ¹							
	Total.		Steam. ²		Sail.		Unrigged ¹ .	
	1906-1916	1889-1916	1906-1916	1889-1916	1906-1916	1889-1916	1906-1916	1889-1916
Number of vessels.....	8.1	77.0	54.2	279.1	-57.1	-50.6	23.8	214.5
Gross tonnage.....	34.2	144.8	94.0	281.4	-29.1	-37.9	27.2	301.3
Value of vessels.....	130.3	442.1	166.8	689.7	14.4	0.6	65.0	777.0
Gross income.....	135.8	318.0	148.3	508.4	48.8	-9.9	(³)	(³)
Number employed on vessels.....	10.2	33.6	28.9	146.9	-48.6	-71.0	(³)	(³)
Wages.....	53.6	166.3	69.5	303.9	-21.6	-40.7	(³)	(³)
Number of passengers carried.....	-18.9	39.4	-18.9	39.4	-96.1	.....	(³)	(³)
Freight and harbor work (tons of 2,000 pounds).....	29.2	244.4	38.4	(³)	-29.7	(³)	(³)	(³)
Freight carried.....	22.8	(³)	(³)	(³)	(³)	(³)	(³)	(³)
Harbor work.....	34.8	(³)	(³)	(³)	(³)	(³)	(³)	(³)

¹ A minus sign (-) denotes decrease.

² Includes craft propelled by machinery.

³ Figures not available.

DIAGRAM 1.—GROSS TONNAGE OF ALL VESSELS, EXCLUSIVE OF FISHING VESSELS, BY CLASSES: 1916, 1906, AND 1889.

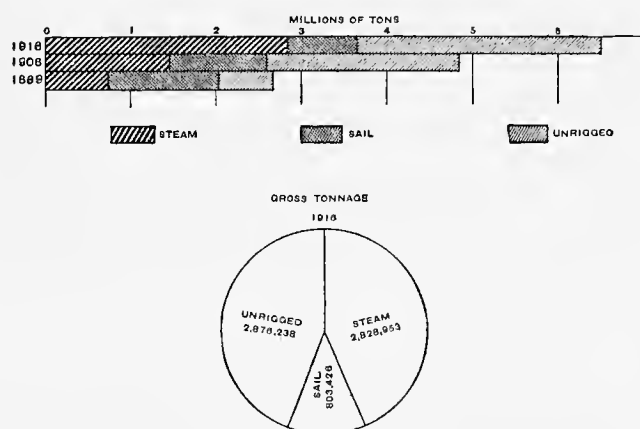


DIAGRAM 2.—VALUE OF ALL VESSELS, EXCLUSIVE OF FISHING VESSELS, BY CLASSES: 1916, 1906, AND 1889.

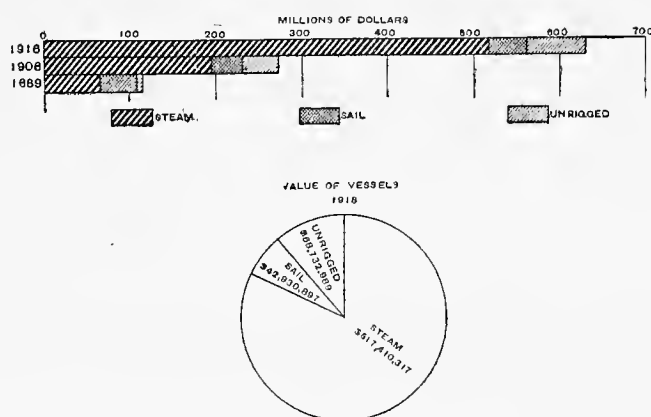
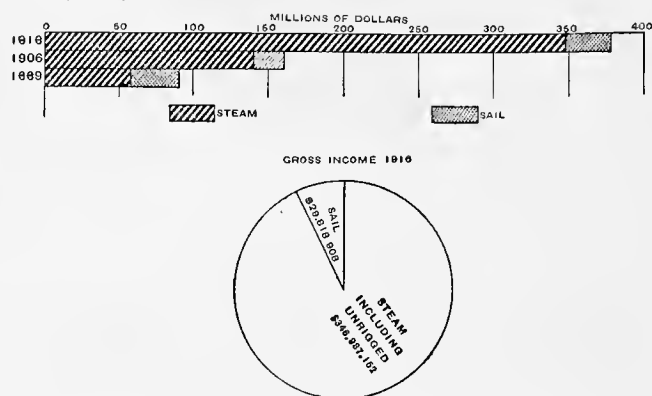


DIAGRAM 3.—GROSS INCOME OF ALL VESSELS, EXCLUSIVE OF FISHING VESSELS; STEAM, INCLUDING UNRIGGED, AND SAIL: 1916, 1906, AND 1889.



The statistics shown in the tables of this report apply only to vessels of American ownership, no craft of foreign ownership being included. This fact explains any apparent discrepancy between the figures reported by the United States Engineers' Office and those shown in this report, the Engineers' reports including all vessels, foreign as well as American owned, while the census reports include the American-owned vessels only.

The figures in Table 1 show in general that the United States marine on the Atlantic and Gulf coasts has made substantial progress since 1906, the number, gross tonnage, and value of the vessels, as well as the amount of freight carried and the gross income received, having increased during the decade.

The total number of vessels of all classes, exclusive of fishing vessels, was 21,658 in 1916, as compared with 20,032 in 1906, and 12,238 in 1889. These figures show an increase of 1,626 vessels, or 8.1 per cent, from 1906 to 1916, the steam vessels, which include all craft propelled by machinery, increasing 2,934, and the unrigged vessels 2,073 in number, while the sail vessels showed a decrease of 3,381. Of the three classes of vessels—steam, sail, and unrigged—the unrigged, consisting chiefly of barges and lighters, outnumbered either of the other classes, forming 49.7 per cent of the total number of vessels reported, and the steam greatly outnumbered the sailing craft, this latter condition having arisen since 1906, when there was a larger number of sailing than steam vessels reported. While the number and gross tonnage of the unrigged craft amounted to almost one-half of the total number and tonnage of the entire fleet of the Atlantic and Gulf coasts, the value of such craft was little more than one-tenth of the total value reported for all vessels. On



STEAMSHIP "AGAWAM."



STEAMER "JAMES TIMPSON."

the other hand, although the number and tonnage of steam vessels represented only about two-fifths of the total number and tonnage reported, the value of such vessels was more than four and one-half times that of the sail and unrigged vessels combined. The total value of the sail vessels increased \$5,409,994, or 14.4 per cent, during the years 1906 to 1916, although the number in 1916 was less than one-half that reported in 1906, and the tonnage also decreased considerably.

The total quantity of freight handled in 1916 amounted to 181,526,448 tons, an increase of 29.2 per cent over that reported in 1906. This increase was in freight reported by steam and unrigged craft, as sailing vessels show a decrease of 29.7 per cent in this respect.

Table 3 shows statistics for the vessels on the Atlantic and Gulf coasts, by occupation, with per cent of total for 1916.

TABLE 3.—ALL VESSELS AND CRAFT, BY OCCUPATION, WITH PER CENT OF TOTAL: 1916.

OCCUPATION.	VESSELS.		TONNAGE.		VALUE OF VESSELS.		GROSS INCOME.		EMPLOYED ON VESSELS.		WAGES.	
	Number.	Per cent of total.	Gross tons.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.	Number.	Per cent of total.	Amount.	Per cent of total.
Total.....	25,387	100.0	6,614,197	100.0	\$642,114,328	100.0	\$395,211,148	100.0	104,224	100.0	\$67,378,700	100.0
Commercial vessels.....	21,389	84.3	6,483,122	98.0	605,403,921	94.3	391,922,685	99.2	96,274	92.4	62,587,107	92.9
Freight and passenger.....	4,770	18.8	3,194,364	48.3	471,124,188	73.4	275,509,040	69.7	47,061	45.2	30,945,707	45.9
Tugs and other towing vessels.....	1,856	7.3	153,122	2.3	37,841,756	5.9	26,573,930	6.7	11,831	11.4	10,096,502	15.0
Fishing vessels.....	3,729	14.7	105,580	1.6	13,040,125	2.0	18,405,088	4.7	19,246	18.5	8,475,736	12.6
Ferryboats.....	262	1.0	153,818	2.3	14,664,863	2.3	10,318,559	2.6	2,549	2.4	2,437,826	3.6
Municipal.....	28	0.1	20,984	0.3	2,350,185	0.4	1,227,623	0.3	462	0.4	524,773	0.8
Railroad.....	79	0.3	78,426	1.2	7,793,618	1.2	5,394,822	1.4	1,045	1.0	1,077,059	1.6
All other.....	155	0.6	54,408	0.8	4,521,060	0.7	3,696,114	0.9	1,042	1.0	835,994	1.2
Unrigged craft.....	10,772	42.4	2,876,238	43.5	68,732,989	10.7	61,116,068	15.5	15,587	15.0	10,631,336	15.8
Yachts.....	3,082	12.1	91,946	1.4	27,382,512	4.3	147,728	(1)	5,578	5.4	2,988,208	4.4
Miscellaneous.....	916	3.6	39,129	0.6	9,827,995	1.4	3,140,735	0.8	2,372	2.2	1,803,385	2.7

¹ Less than one-tenth of 1 per cent.

The extensive use of the unrigged craft is again shown in this table, and inasmuch as tugs are employed a large part of the time in towing unrigged craft, the totals for the two classes of vessels may be taken as representing the craft used in barge traffic and in lighterage work. The number and tonnage of these two classes together constituted practically one-half of the total number and tonnage of all vessels in the fleet of the Atlantic and Gulf coasts. In respect to value and gross income, however, the freight and passenger craft were by far the most important, reporting 73.4 per cent of the value of all vessels and 69.7 per cent of the gross income. Fishing vessels, shown separately for the first time at this census, numbering 3,729, were valued at \$13,040,125, and reported a gross income of \$18,405,088. Of the five classes of commercial vessels shown in this table, the fishing craft were the only ones whose earnings exceeded their valuation, the percentage of earnings on their valuation being 141.1. In this connection, however, it should not be forgotten that the gross income for fishing vessels represented the value of the catch. The unrigged craft were second in this respect, their earnings amounting to 88.9 per cent of their valuation.

The importance of ferry traffic is also shown in the table, 262 ferryboats, with a valuation of \$14,664,863 and an income of \$10,318,559, being reported. These boats were used chiefly in the ports of New York, Philadelphia, and Boston. There were 3,082 yachts on the Atlantic and Gulf coasts, with a valuation of \$27,382,512 and a total tonnage of 91,946.

Table 4 shows the number, gross tonnage, and value of steam vessels, by occupation, with per cent of increase and per cent that each class is of the total for 1916 and 1906.

TABLE 4.—STEAM VESSELS,¹ BY OCCUPATION, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916 AND 1906.

OCCUPATION AND CENSUS YEAR.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Value of vessels.	Per cent of total.
Total:						
1916.....	8,347	100.0	2,828,953	100.0	\$517,410,317	100.0
1906.....	5,413	100.0	1,457,894	100.0	\$193,926,327	100.0
Percent of increase.....	54.2		94.0		166.8	
Freight and passenger:						
1916.....	2,798	33.5	2,403,734	85.0	\$430,299,612	83.2
1906.....	1,523	28.1	1,045,811	71.7	\$121,136,485	62.5
Percent of increase.....	83.7		129.8		255.2	
Tugs and other towing vessels:						
1916.....	1,856	22.2	153,122	5.4	\$37,841,756	7.3
1906.....	1,690	31.2	148,992	10.2	\$25,894,551	13.4
Percent of increase.....	9.8		2.8		46.1	
Ferryboats:						
1916.....	262	3.1	153,818	5.4	\$14,664,863	2.8
1906.....	270	5.0	162,834	11.2	\$19,970,466	10.3
Percent of increase.....	-3.0		-5.5		-26.6	
Yachts:						
1916.....	2,587	31.0	81,766	2.9	\$25,590,224	4.9
1906.....	1,577	29.1	70,461	4.8	\$21,290,339	11.0
Percent of increase.....	64.0		16.0		20.2	
Miscellaneous:						
1916.....	844	10.1	36,513	1.3	\$9,013,862	1.7
1906.....	353	6.5	29,796	2.0	\$5,634,486	2.9
Percent of increase.....	139.1		22.5		60.0	

¹ Includes craft propelled by machinery.

² A minus sign (-) denotes decrease.

Steam craft of all classes show decided increases from 1906 to 1916. The number of such vessels increased 2,934, or 54.2 per cent, the gross tonnage 1,371,059, or 94 per cent, and their value \$323,483,990, or 166.8 per cent.

The most pronounced gains are shown for the freight and passenger fleet, which class in 1916 represented 33.5 per cent of the number of all steam vessels, 85 per cent of the tonnage, and 83.2 per cent of the value, a decided proportionate increase since 1906. Ferryboats are the one class that shows an actual and relative decrease in all details presented in the table. Tugs and yachts, although increasing actually, decreased relatively, due to the exceptional gain in the freight and passenger craft.

Table 5 presents statistics for canal boats and all other unrigged craft, with per cent of total for 1916 and 1906.

TABLE 5.—UNRIGGED VESSELS, BY OCCUPATION, WITH PER CENT EACH CLASS IS OF TOTAL: 1916 AND 1906.

OCCUPATION AND CENSUS YEAR.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Value of vessels.	Per cent of total.
Total:						
1916.....	10,772	100.0	2,876,238	100.0	\$68,732,989	100.0
1906.....	8,699	100.0	2,260,622	100.0	41,658,685	100.0
Canal boats:						
1916.....	445	4.1	63,730	2.2	914,437	1.3
1906.....	663	7.6	103,877	4.6	1,112,475	2.7
All other unrigged:						
1916.....	10,327	95.9	2,812,508	97.8	67,818,552	98.7
1906.....	8,036	92.4	2,156,745	95.4	40,546,210	97.3

In 1916 the unrigged vessels, other than canal boats, numbered 10,327, and embraced barges, lighters, scows, dredges, pile drivers, etc. The 445 canal boats shown in the table represent those that were operated but little, if any, on the canals but were located in the harbors of the Atlantic coast, chiefly in New York. Their relative importance was slight. The barges, lighters, etc., represented 97.8 per cent of the total gross tonnage and 98.7 per cent of the total value of all unrigged craft.

Table 6 shows the number, gross tonnage, and value of sailing vessels, by occupation, and per cent that each class is of total, for 1916 and 1906.

TABLE 6.—SAIL VESSELS,¹ BY OCCUPATION, WITH PER CENT EACH CLASS IS OF TOTAL: 1916 AND 1906.

OCCUPATION AND CENSUS YEAR.	Number of vessels.	Per cent of total.	Gross tonnage.	Per cent of total.	Value of vessels.	Per cent of total.
Total:						
1916.....	2,539	100.0	803,426	100.0	\$42,930,897	100.0
1906.....	5,920	100.0	1,132,905	100.0	37,520,903	100.0
Freight and passenger:						
1916.....	1,977	77.7	790,630	98.4	40,824,576	95.1
1906.....	4,227	71.4	1,105,901	97.6	33,213,849	88.5
Yachts:						
1916.....	495	19.5	10,180	1.3	1,792,288	4.2
1906.....	1,358	22.9	21,046	1.9	3,775,743	10.1
Miscellaneous:						
1916.....	72	2.8	2,616	0.3	314,033	0.7
1906.....	335	5.7	5,958	0.5	531,311	1.4

¹ Includes schooner barges.

The decrease in the total number and tonnage of sailing vessels, as shown in Table 6, indicates plainly

the decline of such craft during the ten-year period 1906-1916, each class sharing in the loss. In their total valuation, however, there was an increase of \$5,409,994, or 14.4 per cent, and the average value per ton increased from \$33 in 1906 to \$53 in 1916. This increase in value is due to the gain in the freight and passenger class, since the yachts and miscellaneous craft decreased in value during the ten-year period.

Table 7 shows separate statistics for schooner barges, with per cent of increase, for 1916 and 1906.

TABLE 7.—SCHOONER BARGES: 1916 AND 1906.

	1916	1906	Per cent of increase. ¹
Number of vessels.....	309	389	-20.6
Gross tonnage.....	312,827	323,618	-3.3
Value of vessels.....	\$16,274,554	\$7,497,833	117.1
Number employed on vessels.....	1,481	1,458	1.6
Wages.....	\$798,648	\$721,911	10.6

¹ A minus sign (-) denotes decrease.

The figures for sailing vessels in the preceding table and throughout this report include those for schooner barges, statistics for which are shown separately in Table 7. These vessels reflect the same condition shown for sailing vessels as a whole, decreases in number and tonnage, with an increase in value.

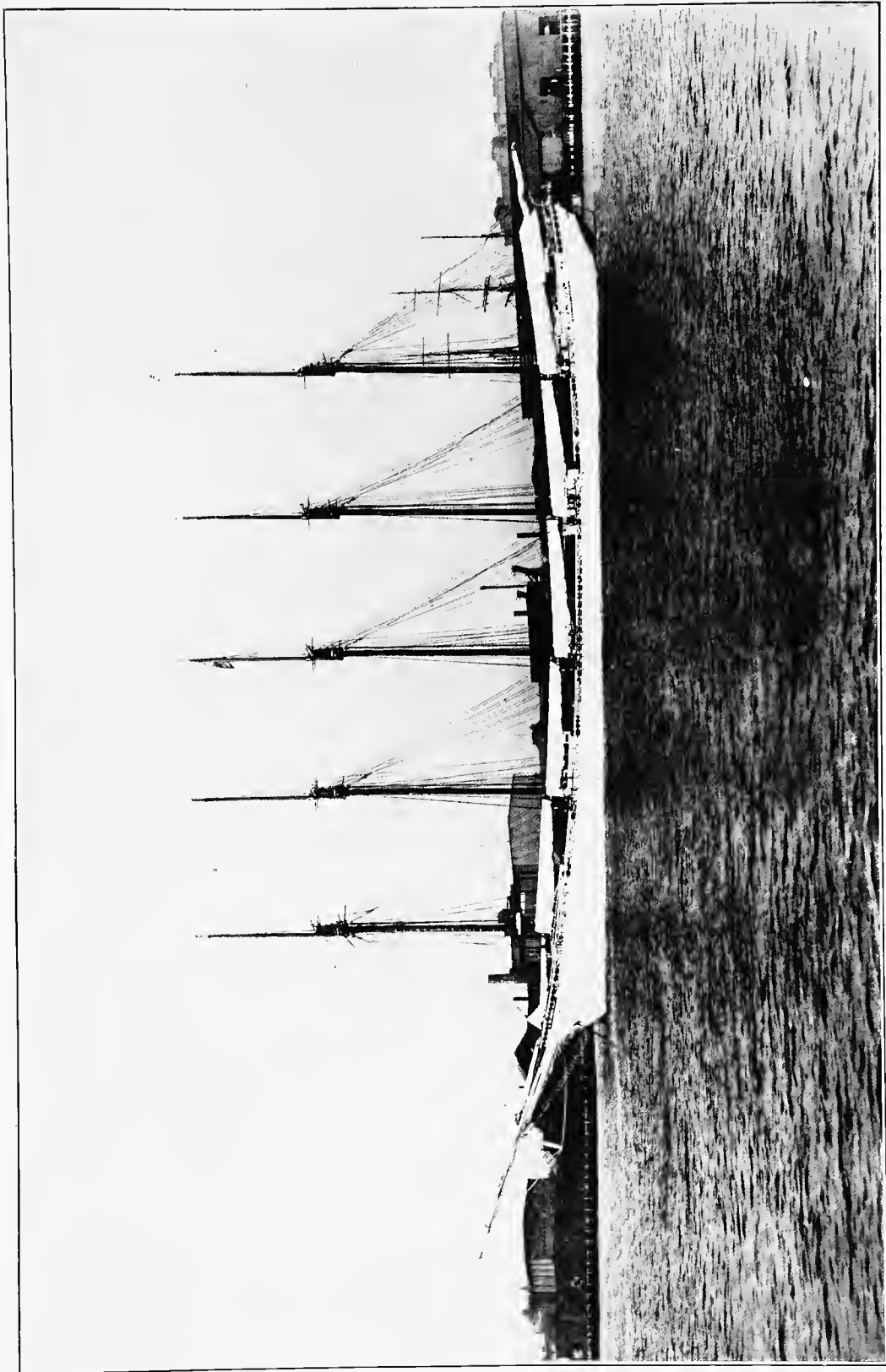
FERRYBOATS.

Details regarding ferryboats used at and about the ports of the Atlantic and Gulf coasts are given in Table 8, for the years 1916 and 1906.

Nearly one-half of the ferryboats in 1916 were used in the waterways about New York City. These boats also reported three-fourths of the total tonnage and value shown for ferryboats and about two-thirds of the gross income and number of passengers carried. Ferry service at Philadelphia required less than one-tenth of the gross tonnage and carried less than one-sixth of the total number of passengers.

The number of passengers carried on ferryboats was naturally very large, the 218,045,127 passengers reported for the ferry traffic forming 91.9 per cent of the total number carried on all classes of vessels of the Atlantic and Gulf coasts.

Notwithstanding the large number of ferry passengers reported for 1916, there was an actual decrease of 54,551,543, or 20 per cent, as compared with 1906, due wholly to the decrease in New York which was 64,493,394, or 30.9 per cent, caused by the introduction of "tubes" under the harbor waters and the addition of several bridges connecting the city with the Long Island shore. The decrease in the value of these ferryboats was due chiefly to their age and wornout condition, which made the depreciation very heavy.



SCHOONER "DOROTHY PALMER."

TABLE 8.—FERRYBOATS, BY DISTRICTS, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916 AND 1906.

DISTRICT.	Cen- sus year.	Num- ber of ves- sels.	Per cent of total.	Gross tonnage.	Per cent of total.	Value of vessels.	Per cent of total.	Gross income.	Per cent of total.	Num- ber em- ployed on ves- sels.	Per cent of total.	Wages.	Per cent of total.	Number of passengers carried.	Per cent of total.
Total.....	1916 1906	262 270	100.0 100.0	153,818 162,834	100.0 100.0	\$14,664,863 \$19,970,466	100.0 100.0	\$10,318,559 \$10,571,534	100.0 100.0	2,549 2,388	100.0 100.0	\$2,437,826 \$2,098,540	100.0 100.0	218,045,127 272,596,670	100.0 100.0
Per cent of increase ¹		-3.0		-5.5		-26.6		-2.4		6.7		16.2		-20.0	
New York.....	1916 1906	125 152	47.7 56.3	115,363 129,690	75.0 79.6	\$11,406,584 \$17,098,677	77.8 85.6	\$7,118,972 \$8,423,119	69.0 79.7	1,600 1,622	62.8 67.9	\$1,669,473 \$1,578,839	68.5 75.2	144,190,729 208,684,123	66.1 76.6
Per cent of increase ¹		-17.8		-11.0		-33.3		-15.5		-1.4		5.7		-30.9	
Philadelphia.....	1916 1906	19 25	7.3 9.3	10,962 10,306	7.1 6.3	\$1,036,459 \$918,867	7.1 4.6	\$1,251,163 \$1,009,295	12.1 9.5	228 217	8.9 9.1	\$230,962 \$195,560	9.5 9.3	34,662,070 30,616,853	15.9 11.2
Per cent of increase.....				6.4		12.8		24.0		5.1		18.1		13.2	
All other districts.....	1916 1906	118 93	45.0 34.4	27,493 22,838	17.9 14.0	\$2,221,820 \$1,952,922	15.2 9.8	\$1,948,424 \$1,139,120	18.9 10.8	721 549	28.3 23.0	\$537,391 \$324,141	22.0 15.4	39,192,328 33,295,694	18.0 12.2
Per cent of increase.....				20.4		13.8		71.0		31.3		65.8		17.7	

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

The extent to which ferryboats were operated by municipalities is shown in Table 9.

Of the 262 ferryboats on the Atlantic and Gulf coasts, 28 were engaged in municipal service, principally in New York and Boston Harbors. These municipal ferryboats in 1916 carried 23,930,206 passengers, or 11 per cent of the total number transported in ferryboats on the entire Atlantic and Gulf coasts. City ferryboats in New York Harbor alone carried 18,748,804 passengers, or 78.3 per cent of the total for all municipal fer-

ries on the Atlantic and Gulf coasts. Figures for Boston Harbor municipal ferries showed a total of 4,628,352 passengers transported in 1916. While the municipal ferries in New York Harbor show a gain of 49.7 per cent in the number of passengers carried in 1916 as compared with 1906, those in Boston Harbor show a loss of 36.1 per cent, the decrease in Boston Harbor being partly accounted for by the general use made of the subway tunnel between the city proper and East Boston.

TABLE 9.—MUNICIPAL FERRIES, WITH PER CENT OF INCREASE: 1916 AND 1906.

DISTRICT.	Census year.	Number of vessels.	Gross tonnage.	Value of vessels.	GROSS INCOME.		Number employed on vessels.	Wages.	Number of passengers carried.
					Passenger.	All other sources.			
Total.....	1916 1906	28 25	20,984 19,337	\$2,350,185 \$2,466,447	\$757,083 \$620,780	\$470,540 \$263,172	462 264	\$524,773 \$433,029	23,930,206 19,784,055
Per cent of increase ¹			8.5	-4.7	22.0	78.8	75.0	21.2	21.0
New York Harbor.....	1916 1906	16 16	15,471 14,829	\$2,107,199 \$2,253,000	\$696,353 \$557,437	\$419,219 \$220,905	364 188	\$413,908 \$360,159	18,748,804 12,521,847
Per cent of increase ¹			4.3	-6.5	24.9	89.8	93.6	14.9	49.7
Boston Harbor.....	1916 1906	7 7	4,728 4,448	\$208,986 \$209,347	\$46,284 \$62,373	\$47,341 \$41,037	84 72	\$99,445 \$70,720	4,628,352 7,242,808
Per cent of increase ¹			6.3	-0.2	-25.8	15.4		40.6	-36.1
Small points on Connecticut River.....	1916 1906	2 2	110 60	\$9,000 \$4,100	\$1,245 \$970	\$1,853 \$1,230	4 4	\$3,596 \$2,150	25,111 19,400
Per cent of increase.....				119.5	28.4	50.7		67.3	29.4
All other districts.....	1916	3	675	\$25,000	\$13,201	\$2,127	10	\$7,824	527,939

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

GOVERNMENT VESSELS.

While this report does not include vessels owned by the United States Government, it does contain facts regarding the vessels owned and operated by state and city governments, statistics for which are presented in Table 10 for 1916 and 1906.

The craft shown in this table include municipal ferryboats, fire boats, police-patrol boats, garbage boats, quarantine boats, ambulance and hospital boats, dredges, pilot boats, ice breakers, etc.

Comparative figures show that these municipal and state owned craft increased from 213 in 1906 to 268 in 1916, or 25.8 per cent. The gross tonnage increased 31.2 per cent, and their value 16.4 per cent during the decade.

TABLE 10.—VESSELS OWNED BY STATE AND CITY GOVERNMENTS: 1916 AND 1906.

	Total.	Steam. ¹	Sail.	Unrigged.
Number of vessels:				
1916.....	268	138	2	128
1906.....	213	104	3	106
Gross tonnage:				
1916.....	60,700	34,499	70	26,131
1906.....	46,204	31,228	78	14,958
Value of vessels:				
1916.....	\$7,181,662	\$6,392,567	\$6,500	\$782,595
1906.....	\$6,169,775	\$5,470,975	\$6,380	\$692,420
Gross income:				
1916.....	\$1,592,307	\$1,288,079	\$5,000	\$299,228
1906.....	\$2,024,807	\$1,131,594		\$1,793,213
Number employed on vessels:				
1916.....	1,462	1,387	6	69
1906.....	1,369	839	8	522
Wages:				
1916.....	\$1,583,858	\$1,535,646	\$3,810	\$44,402
1906.....	\$1,632,858	\$1,008,090	\$5,280	\$619,488
Number of passengers carried:				
1916.....	23,930,206	23,930,206		
1906.....	20,183,209	20,183,209		

¹ Includes craft propelled by machinery.

The general decrease in income and in the number of employees on unrigged craft from 1906 to 1916, although the number of vessels actually increased, may be accounted for by the fact that a number of the craft owned by city governments are leased to contractors, who operate them in connection with their other vessels, and the income, number of crew, and wages paid are included in the reports of these contractors.

FISHING CRAFT.

Details of the American fishing fleet sailing from the ports of the Atlantic and Gulf coasts are given in Tables 11 and 12 for 1916.

TABLE 11.—FISHING VESSELS: 1916.

	Total.	Steam.	Gasoline.	Sail.
Number of vessels.....	3,729	206	1,805	1,718
Gross tonnage.....	105,580	29,728	31,328	44,524
Value of vessels.....	\$13,040,125	\$5,761,664	\$3,885,809	\$3,392,652
Gross income.....	\$18,405,088	\$4,499,383	\$7,904,104	\$6,001,601
Number employed on vessels.....	19,246	3,270	6,896	9,080
Wages.....	\$8,475,736	\$1,654,605	\$3,550,596	\$3,270,535

TABLE 12.—FISHING VESSELS GROUPED ACCORDING TO GROSS TONNAGE: 1916.

TONNAGE.	Total.	Steam.	Gasoline.	Sail.
Total:				
Number of vessels.....	3,729	206	1,805	1,718
Gross tonnage.....	105,580	29,728	31,328	44,524
5 to 49 tons:				
Number of vessels.....	3,260	44	1,712	1,504
Gross tonnage.....	46,114	1,313	22,961	21,840
50 to 99 tons:				
Number of vessels.....	200	41	62	97
Gross tonnage.....	14,703	3,130	4,578	6,995
100 to 199 tons:				
Number of vessels.....	203	59	31	113
Gross tonnage.....	26,544	8,298	3,789	14,457
200 to 299 tons:				
Number of vessels.....	46	46		
Gross tonnage.....	11,494	11,494		
300 to 399 tons:				
Number of vessels.....	17	13		4
Gross tonnage.....	5,342	4,110		1,232
400 to 499 tons:				
Number of vessels.....	2	2		
Gross tonnage.....	883	883		
500 to 999 tons:				
Number of vessels.....	1	1		
Gross tonnage.....	500	500		

The fishing vessels on the Atlantic and Gulf coasts numbered 3,729, with a gross tonnage of 105,580. Of these, 1,805, or almost one-half, were gasoline power craft, and 1,718 were sailing vessels, while only 206 used steam power. The total value of this fishing fleet was \$13,040,125, with a gross income of \$18,405,088, of which \$128,693 was received for the transportation of 76,396 tons of freight.

Of the total number of all classes of fishing vessels, 3,260, or 87.4 per cent, were of less than 50 tons gross register. Of the gasoline craft 94.8 per cent were of less than 50 tons gross tonnage and of the sailing vessels 87.5 per cent were in this tonnage group. There were only 4 sailing vessels of over 300 tons gross register and these were engaged in the whaling industry.

The income when compared with the value per gross ton for fishing vessels exceeds that of all other classes of craft. The largest proportion of the total gross tonnage, 42.2 per cent, was in the sailing vessels, but the largest per cent of the total income, 42.9 per cent, was earned by the gasoline craft. Steam vessels represented 44.2 per cent of the total value of all fishing vessels, 28.2 per cent of their tonnage, and but 24.4 per cent of the total income. In this connection, the income for fishing vessels represents the total value of the catch and is not comparable, therefore, with the income reported for any other class of craft. Another condition pertaining to these fishing craft is that many of them are operated only a few weeks of the season, their owners devoting most of the year to other pursuits.

OWNERSHIP OF VESSELS.

In Table 13 the number, tonnage, and value of craft propelled by machinery, and sailing vessels are shown, by character of ownership, for 1916, 1906, and 1889.

TABLE 13.—OWNERSHIP FOR STEAM AND SAIL VESSELS: 1916, 1906, AND 1889.

CLASS AND OWNERSHIP.	NUMBER OF VESSELS.			GROSS TONNAGE.			VALUE OF VESSELS.		
	1916	1906	1889	1916	1906	1889	1916	1906	1889
Total.....	10,886	11,333	8,813	3,632,379	2,590,799	2,034,962	\$560,341,214	\$231,447,230	\$108,204,622
Incorporated company.....	3,430	2,630	1,019	3,090,356	1,644,044	671,181	497,705,222	167,929,716	43,376,790
All other forms of ownership.....	7,456	8,703	7,794	542,023	946,755	1,463,781	62,635,992	63,517,514	64,827,832
Steam¹.....	8,347	5,413	2,536	2,828,953	1,457,894	741,770	517,410,317	193,926,327	65,518,640
Incorporated company.....	2,846	2,072	917	2,614,036	1,244,283	545,683	471,074,753	155,819,420	42,892,910
All other forms of ownership.....	5,501	3,341	1,619	214,917	213,611	196,087	46,335,564	38,106,907	22,625,730
Sail.....	2,539	5,920	6,277	803,426	1,132,905	1,293,192	42,930,897	37,520,903	42,685,982
Incorporated company.....	584	558	102	476,320	399,761	25,498	25,630,469	12,110,296	483,880
All other forms of ownership.....	1,955	5,362	6,175	327,106	733,144	1,267,694	16,300,428	25,410,607	42,202,102
Per cent of total:									
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Incorporated company.....	31.5	23.2	11.6	85.1	63.5	28.1	88.8	72.6	40.1
All other forms of ownership.....	68.5	76.8	88.4	14.9	36.5	71.9	11.2	27.4	59.9
Steam¹.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Incorporated company.....	34.1	38.3	36.2	92.4	85.3	73.6	91.0	80.3	65.5
All other forms of ownership.....	65.9	61.7	63.8	7.6	14.7	26.4	9.0	19.7	34.5
Sail.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Incorporated company.....	23.0	9.4	1.6	59.3	35.3	2.0	62.0	32.3	1.1
All other forms of ownership.....	77.0	90.6	98.4	40.7	64.7	98.0	38.0	67.7	98.9

¹ Includes craft propelled by machinery.

The most striking feature of this table is the increase in vessels under corporate ownership, the number, tonnage, and value of vessels under all other forms of ownership showing decreases from 1906 to 1916. Of a total of 10,886 craft in 1916, corporations owned 3,430, or 31.5 per cent, as compared with 2,630, or 23.2 per cent, in 1906. The preponderance of corporate ownership, however, is more clearly shown in the figures for tonnage and value of vessels. In 1916 the gross tonnage of steam and sail vessels combined owned by incorporated companies was 3,090,356, or 85.1 per cent of the total, and \$497,705,222, or 88.8 per cent of the total value of these vessels, was the property of corporations. The corresponding percentages for 1906 were 63.5 and 72.6 per cent, respectively. The average size of steam and sail vessels owned by corporations is greatly in excess of that for vessels under other forms of ownership. In 1916 the 3,430 steam and sail vessels owned by corporations had an average gross tonnage of 901, while the 7,456 such vessels under other forms of ownership averaged only 73 tons per vessel.

The total tonnage of the 2,846 steam vessels owned by corporations was more than twelve times, and the value more than ten times as great as the total tonnage and value of the 5,501 vessels of this class otherwise owned.

In Table 14 is shown the number, tonnage, and value of the vessels belonging to the fleet of the Atlantic and Gulf coasts, by ownership, in more detailed form, for 1916 and 1906.

The increasing tendency of the ownership of shipping to centralize in corporations is shown also in this table,

the proportions which the number, tonnage, and value of vessels under corporate ownership formed of the total increasing considerably from 1906 to 1916, while vessels owned by individuals and firms showed decreased proportions in all three respects during the same period.

TABLE 14.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CHARACTER OF OWNERSHIP, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916 AND 1906.

OWNERSHIP AND CENSUS YEAR.	VESSELS.		TONNAGE.		VALUE OF VESSELS	
	Num-ber.	Per cent of total.	Gross tons.	Per cent of total.	Amount.	Per cent of total.
Total:						
1916.....	21,658	100.0	6,508,617	100.0	\$629,074,203	100.0
1906.....	20,032	100.0	4,851,421	100.0	\$273,105,915	100.0
Per cent of increase.....	8.1	.....	34.2	.....	130.3	.....
Individual:						
1916.....	8,307	38.4	787,787	12.1	\$52,755,687	8.4
1906.....	8,517	42.5	844,064	17.4	\$45,457,935	16.6
Per cent of increase ¹	-2.5	.....	-6.7	.....	16.1	.....
Firm:						
1916.....	2,138	9.9	441,266	6.8	\$15,187,996	2.4
1906.....	2,849	14.2	666,005	13.7	\$19,636,772	7.2
Per cent of increase ¹	-25.0	.....	-33.7	.....	-22.7	.....
Incorporated company:						
1916.....	10,846	50.1	5,200,797	79.9	\$552,588,317	87.8
1906.....	8,341	41.6	3,246,215	66.9	\$199,516,774	73.1
Per cent of increase.....	30.0	.....	60.2	.....	177.0	.....
All other:						
1916.....	367	1.7	78,787	1.2	\$8,542,203	1.4
1906.....	325	1.6	95,137	2.0	\$8,494,434	3.1
Per cent of increase ¹	12.9	.....	-17.2	.....	0.6	.....

¹ A minus sign (—) denotes decrease.

CLASSIFICATION OF VESSELS BY OCCUPATION.

Table 15 shows the statistics for each form of ownership, according to the class and occupation of the vessels, for 1916 and 1906.

TABLE 15.—NUMBER AND GROSS TONNAGE OF VESSELS, BY CHARACTER OF OWNERSHIP AND BY CLASS AND OCCUPATION: 1916 AND 1906.

CLASS AND OCCUPATION.	Census year.	TOTAL.		INDIVIDUAL.		FIRM.		INCORPORATED COMPANY.		ALL OTHER.	
		Num-ber of vessels.	Gross tonnage.	Num-ber of vessels.	Gross tonnage.	Num-ber of vessels.	Gross tonnage.	Num-ber of vessels.	Gross tonnage.	Num-ber of vessels.	Gross tonnage.
Total.....	1916	21,658	6,508,617	8,307	787,787	2,138	441,266	10,846	5,200,797	367	78,787
	1906	20,032	4,851,421	8,517	844,064	2,849	666,005	8,341	3,246,215	325	95,137
Steam ¹	1916	8,347	2,823,953	4,669	152,432	642	24,249	2,846	2,614,036	190	38,236
	1906	5,413	1,457,894	2,625	130,963	580	48,015	2,072	1,244,283	136	34,633
Freight and passenger.....	1916	2,798	2,403,734	1,210	43,537	262	10,288	1,314	2,347,147	12	2,762
	1906	1,523	1,045,811	492	37,838	170	27,528	845	977,868	16	2,577
Tugs and other towing vessels.....	1916	1,856	153,122	496	22,183	186	10,259	1,156	119,371	18	1,309
	1906	1,690	148,992	455	20,236	300	17,407	911	107,183	24	4,166
Ferryboats.....	1916	262	153,818	30	3,224	5	125	199	129,486	28	20,983
	1906	270	162,834	25	1,874	4	199	216	141,424	25	19,337
Yachts.....	1916	2,587	81,766	2,392	76,011	118	2,069	64	3,508	13	178
	1906	1,577	70,461	1,463	67,540	74	1,717	36	1,133	4	71
Miscellaneous.....	1916	844	36,513	541	7,477	71	1,508	113	14,524	119	13,004
	1906	353	29,796	190	3,475	32	1,104	64	16,675	67	8,482
Sail.....	1916	2,539	803,426	1,515	180,292	393	132,381	584	476,320	47	14,433
	1906	5,920	1,132,905	4,091	335,536	1,189	349,135	558	399,761	82	45,473
Freight and passenger.....	1916	1,972	790,630	1,006	169,980	358	131,925	569	474,773	39	13,952
	1906	4,227	1,105,901	2,552	315,669	1,082	347,648	542	398,702	51	43,882
Yachts.....	1916	495	10,180	458	9,585	31	355	5	218	1	22
	1906	1,358	21,046	1,269	20,038	75	754	8	150	6	104
Miscellaneous.....	1916	72	2,616	51	727	4	101	10	1,329	7	459
	1906	335	5,958	270	2,829	32	733	8	909	25	1,487
Unrigged.....	1916	10,772	2,876,238	2,123	455,063	1,103	284,636	7,416	2,110,441	130	26,098
	1906	8,699	2,260,622	1,801	374,565	1,080	208,855	5,711	1,602,171	107	15,031

¹ Includes craft propelled by machinery.

Of the total tonnage of steam craft owned by corporations, 89.8 per cent in 1916 and 78.6 per cent in 1906 was used in transporting freight and passengers. At the corresponding censuses the tonnage of tugs and ferryboats under corporate ownership far exceeded that under any other form of ownership. Sailing vessels, under all forms of ownership, were used mainly in the freight and passenger service. From 1906 to 1916 steam vessels under individual ownership showed a large increase in number, 77.9 per cent, but the increase in tonnage was only 16.4 per cent. In the case of steamers under corporate ownership, this condition was reversed, the number of vessels increasing 37.4 per cent and the tonnage 110.1 per cent. Vessels in this class owned by firms increased 10.7 per cent in number, but decreased 49.5 per cent in tonnage. From 1906 to 1916 sailing vessels decreased both in number and tonnage, although those owned by corporations showed a

small increase in both respects. These vessels corporately owned increased from 9.4 per cent of the total number in 1906 to 23 per cent in 1916, and from 35.3 per cent of the total tonnage in 1906 to 59.3 per cent in 1916. Sailing vessels owned by individuals decreased in number from 69.1 per cent of the total in 1906 to 59.7 per cent in 1916, and in tonnage from 29.9 per cent to 22.4 per cent. Figures for the unriggered class show that in 1916 corporations owned 68.8 per cent of the number and 73.4 per cent of the tonnage of such vessels. The corresponding percentages for 1906 were 65.7 and 70.9, respectively.

CONSTRUCTION.

The classification of the shipping of the Atlantic coast and Gulf of Mexico with reference to material of construction is shown, by class and occupation, for 1916, 1906, and 1889, in Table 16.

TABLE 16.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CHARACTER OF CONSTRUCTION AND BY CLASS AND OCCUPATION: 1916, 1906, AND 1889.

CLASS AND OCCUPATION.	Census year.	TOTAL.			METAL.			WOOD.			COMPOSITE.		
		Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.
Total.....	1916	21,658	6,508,617	\$629,074,203	1,769	2,776,363	\$476,382,954	19,850	3,720,454	\$150,657,529	39	11,800	\$2,033,720
	1906	20,032	4,851,421	273,105,915	1,148	1,247,838	155,776,134	18,827	3,591,278	115,877,581	57	12,305	1,452,200
	1889	12,238	2,658,445	116,042,062	434	364,283	33,622,030	11,714	2,269,558	81,236,912	90	24,604	1,183,120
Steam ¹	1916	8,347	2,828,953	517,410,317	1,417	2,462,024	455,549,017	6,901	355,766	59,903,580	29	11,163	1,957,720
	1906	5,413	1,457,894	193,926,327	993	1,086,446	147,640,277	4,383	365,616	45,280,050	32	5,832	1,006,000
	1889	2,536	741,770	65,518,640	421	355,065	32,897,230	2,091	381,340	32,073,610	24	5,365	547,800
Freight and passenger.....	1916	2,798	2,403,734	430,299,612	727	2,221,782	405,238,057	2,059	172,448	23,589,106	12	9,504	1,472,449
	1906	1,523	1,045,811	121,136,485	395	849,069	104,382,729	1,123	193,987	16,563,756	5	2,755	190,000
	1889	810	487,939	36,989,280	188	254,457	21,720,810	612	229,165	14,988,470	10	4,317	230,000
Tugs and other towing vessels.....	1916	1,856	153,122	37,841,756	388	72,275	20,109,246	1,467	80,737	17,721,539	1	110	10,971
	1906	1,690	148,922	25,894,551	323	70,134	12,055,761	1,363	78,582	13,808,790	4	276	30,000
	1889	1,095	61,359	10,203,330	103	8,583	1,626,800	986	52,555	8,554,730	6	236	21,800
Ferryboats.....	1916	262	153,818	14,664,863	127	117,188	12,251,138	135	36,630	2,413,725	.....	.....	.....
	1906	270	162,834	19,970,466	127	114,493	15,971,767	143	46,336	3,998,699	.....	.....	.....
	1889	214	98,174	7,907,700	59	40,510	3,936,500	155	57,664	3,971,200	.....	.....	.....
Yachts.....	1916	2,587	81,766	25,590,224	121	34,469	12,971,874	2,452	45,856	12,160,850	14	1,441	457,500
	1906	1,577	70,461	21,290,339	107	36,369	11,807,070	1,449	31,944	8,797,269	21	2,148	686,000
	1889	170	11,328	3,520,610	25	4,864	1,649,720	142	6,111	1,735,890	3	353	135,000
Miscellaneous.....	1916	844	36,513	9,013,862	54	16,310	4,978,702	788	20,095	4,018,360	2	108	16,800
	1906	353	29,796	5,634,486	41	16,376	3,422,950	310	12,767	2,111,536	2	663	100,000
	1889	247	82,970	6,897,720	46	46,646	3,963,400	196	35,865	2,823,320	5	459	111,000
Sail.....	1916	2,539	803,426	42,930,897	95	122,678	9,688,773	2,435	680,390	33,174,624	9	358	67,500
	1906	5,920	1,132,905	37,520,903	76	84,726	4,323,786	5,820	1,042,654	32,762,917	24	5,525	434,200
	1889	6,277	1,293,192	42,685,982	13	9,218	724,800	6,198	1,264,735	41,325,862	66	19,239	635,320
Freight and passenger.....	1916	1,972	790,630	40,824,576	85	119,834	9,048,773	1,887	670,796	31,775,803	.....	.....	.....
	1906	4,227	1,105,901	33,213,849	57	82,470	3,588,786	4,168	1,018,738	29,389,063	2	4,693	236,000
	1889	5,229	1,260,362	38,777,627	7	8,737	614,560	5,168	1,232,597	37,658,057	59	19,028	605,070
Yachts.....	1916	495	10,180	1,792,288	10	2,844	640,000	476	6,978	1,084,788	9	358	67,500
	1906	1,358	21,046	3,775,743	19	2,256	735,000	1,317	17,958	2,842,543	22	832	198,200
	1889	628	14,428	2,681,455	6	481	210,300	619	13,875	2,450,655	3	72	20,500
Miscellaneous.....	1916	72	2,616	314,033	.....	.....	.....	72	2,616	314,033	.....	.....	.....
	1906	335	5,958	531,311	.....	.....	.....	335	5,958	531,311	.....	.....	.....
	1889	420	18,402	1,226,900	.....	.....	.....	416	18,263	1,217,150	4	139	9,750
Unriggered.....	1916	10,772	2,876,238	68,732,989	257	191,661	11,145,164	10,514	2,684,298	57,579,325	* 1	279	8,500
	1906	8,699	2,260,622	41,658,685	79	76,666	3,812,071	8,619	2,183,008	37,834,614	1	948	12,000
	1889	3,425	623,483	7,837,440	.....	.....	.....	* 3,425	623,483	7,837,440	.....	.....	.....

¹ Includes craft propelled by machinery.

² Concrete.

³ The character of construction was not reported in 1889, but for purposes of comparison in this table all vessels are assumed to be of wood.

DIAGRAM 4.—GROSS TONNAGE OF VESSELS, BY CLASS AND CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.

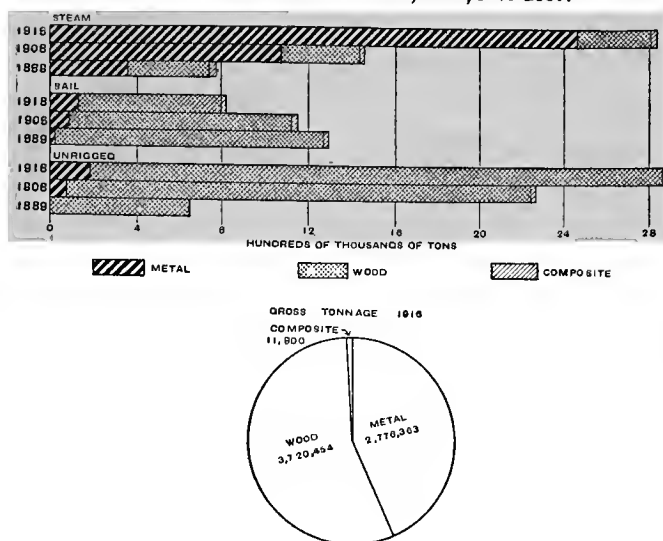
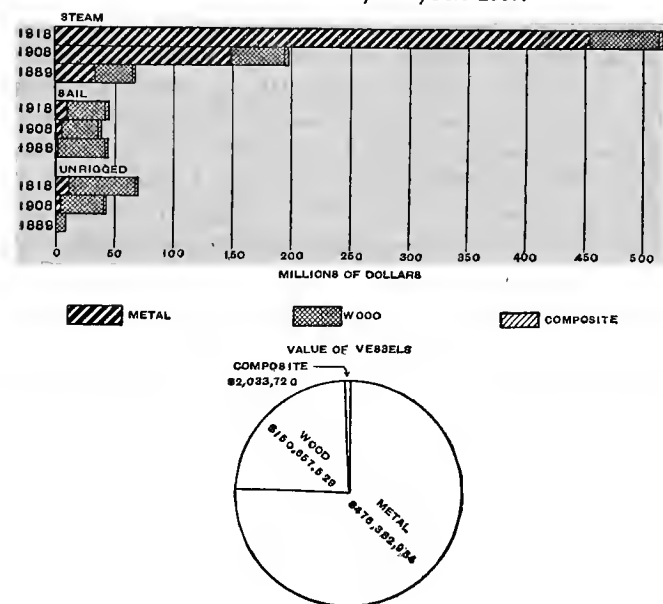


DIAGRAM 5.—VALUE OF VESSELS, BY CLASS AND CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.



As shown in Table 16, the metal (iron or steel) craft in 1916 comprised 42.7 per cent of the total tonnage, the wooden vessels 57.2 per cent, while vessels of composite construction constituted only two-tenths of 1 per cent of the total. The corresponding proportions in 1906 were 25.7, 74, and three-tenths of 1 per cent, and in 1889, 13.7, 85.4, and nine-tenths of 1 per cent, respectively. Large gains during the decade 1906–1916 in both tonnage and value are shown for vessels constructed of metal, amounting to 122.5 per cent in tonnage and 205.8 per cent in value. During the same period the wooden vessels gained 30 per cent in value and 3.6 per cent in tonnage, and craft of composite construction decreased 4.1 per cent in tonnage, with an increase of 40 per cent in value.

In 1916 more than two-fifths of the steam and sail vessels were engaged in freight and passenger traffic. Those propelled by steam numbered 2,798, of which 727 were of metal construction, 2,059 of wooden, and only 12 of composite construction. All three classes of construction in freight and passenger vessels showed substantial gains since 1906 in all items shown in the table, except in the tonnage of wooden vessels, the metal craft increasing 161.6 per cent in gross tonnage and 288.2 per cent in value, while the wooden vessels increased 42.4 per cent in value but showed a loss of 11.1 per cent in tonnage. The vessels of composite construction increased 245 per cent in tonnage and 674.9 per cent in value.

The sail vessels engaged in freight and passenger traffic did not make so good a showing. From 1906 to 1916 the metal craft of this class increased 49.1 per cent in number, 45.3 per cent in tonnage, and 152.1 per cent in value, while the wooden vessels decreased 54.7 per cent in number and 34.2 per cent in tonnage, but increased 8.1 per cent in value. There were no composite sail vessels of this class in 1916.

The unrigged craft of both metal and wooden construction made large gains in number, tonnage, and value in the ten-year period 1906–1916. A total of 257 metal unrigged craft, with a tonnage of 191,661 and a value of \$11,145,164, is shown for 1916, which represents increases of 225.3, 150, and 192.4 per cent, respectively, over the figures reported for 1906. The wooden unrigged craft numbered 10,514, with a tonnage of 2,684,298 and a value of \$57,579,325, representing increases of 22, 23, and 52.2 per cent, respectively, during the ten-year period.

TONNAGE OF VESSELS.

Table 17 shows the gross and net tonnage of the vessels in the fleet of the Atlantic and Gulf coasts, by class and occupation, for 1916 and 1906.

In general, the net tonnage of steam vessels is about two-thirds of the gross tonnage. In the case of sailing vessels, the proportion is considerably higher, the net tonnage being approximately nine-tenths of the gross. In unrigged craft, almost the entire capacity of the vessel is available for cargo and consequently the net tonnage is but slightly less than the gross.

Comparing the figures for the years 1906 and 1916 for all vessels, the per cent of net to gross tonnage shows a decrease from 86.3 per cent in 1906 to 82.7 per cent in 1916. In other words, the cargo space has grown smaller in proportion to the entire capacity of the vessel.

The sail vessels show no material change in the proportion of net to gross tonnage, while the unrigged craft, barges, lighters, etc., actually gained a little during the decade in their proportion of cargo space.

TABLE 17.—GROSS AND NET TONNAGE, WITH PER CENT NET IS OF GROSS TONNAGE, BY CLASS AND OCCUPATION OF VESSELS: 1916 AND 1906.

CLASS, OCCUPATION, AND CENSUS YEAR.	TONNAGE.		Per cent net is of gross tonnage.
	Gross.	Net.	
Total:			
1916.....	6,508,617	5,384,794	82.7
1906.....	4,851,421	4,186,451	86.3
Steam:¹			
1916.....	2,828,953	1,854,037	65.5
1906.....	1,457,894	972,320	66.7
Freight and passenger—			
1916.....	2,403,734	1,574,068	65.5
1906.....	1,045,811	704,560	67.4
Tugs and other towing vessels—			
1916.....	153,122	93,373	61.0
1906.....	148,992	90,021	60.4
Ferryboats—			
1916.....	153,818	104,862	68.2
1906.....	162,834	113,531	69.7
Yachts—			
1916.....	81,766	56,777	69.4
1906.....	70,461	45,228	64.2
Miscellaneous—			
1916.....	36,513	24,957	68.4
1906.....	29,796	18,980	63.7
Sail:			
1916.....	803,426	715,117	89.0
1906.....	1,132,905	1,012,197	89.3
Freight and passenger—			
1916.....	790,630	704,160	89.1
1906.....	1,105,901	987,398	89.3
Yachts—			
1916.....	10,180	8,598	84.5
1906.....	21,046	19,317	91.8
Miscellaneous—			
1916.....	2,616	2,359	90.2
1906.....	5,958	5,482	92.0
Unrigged:			
1916.....	2,876,238	2,815,640	97.9
1906.....	2,260,622	2,201,934	97.4
Canal boats—			
1916.....	63,730	61,000	95.9
1906.....	103,877	101,195	97.4
Miscellaneous—			
1916.....	2,812,508	2,754,550	97.9
1906.....	2,156,745	2,100,739	97.4

¹ Includes craft propelled by machinery.

Table 18 shows the number, average size, value per ton, and value per vessel of the steam, sail, and un-

rigged craft of the Atlantic and Gulf coasts for 1916, 1906, and 1889.

TABLE 18.—NUMBER, GROSS TONNAGE, AND VALUE OF DIFFERENT CLASSES OF VESSELS: 1916, 1906, AND 1889.

CLASS AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Value of vessels.	Average tonnage per vessel.	Average value per ton.	Average value per vessel.
Total:						
1916.....	21,658	6,508,617	\$629,074,203	301	\$97	\$29,046
1906.....	20,032	4,851,421	273,105,915	242	56	13,633
1889.....	12,238	2,658,445	116,042,062	217	44	9,482
Steam:¹						
1916.....	8,347	2,828,953	517,410,317	339	183	61,988
1906.....	5,413	1,457,894	193,926,327	269	133	35,826
1889.....	2,536	741,770	65,518,640	292	88	25,835
Sail:						
1916.....	2,539	803,426	42,930,897	316	53	16,909
1906.....	5,920	1,132,905	37,520,903	191	33	6,338
1889.....	6,277	1,293,182	42,685,982	206	33	6,800
Unrigged:						
1916.....	10,772	2,876,238	68,732,989	267	24	6,381
1906.....	8,699	2,260,622	41,658,685	260	18	4,789
1889.....	3,425	623,483	7,837,440	182	13	2,288

¹ Includes craft propelled by machinery.

The average tonnage of all vessels increased 24.4 per cent from 1906 to 1916, and the average value per vessel 113.1 per cent during that period. In fact, since 1889 (27 years) the average value per vessel has risen from \$9,482 to \$29,046, or 206.3 per cent. Of the three classes, steam, sail, and unrigged vessels, the sail vessels showed the greatest relative increase from 1906 to 1916, both in average tonnage and in average value per vessel. The unrigged craft did not vary much in average tonnage during the decade, but in regard to the average value per vessel this class showed an increase of 33.2 per cent during the 10-year period.

Table 19 shows the steam, sail, and unrigged craft, grouped according to gross tonnage, for 1916 and 1906.

TABLE 19.—VESSELS GROUPED ACCORDING TO GROSS TONNAGE: 1916 AND 1906.

TONNAGE.	TOTAL.		STEAM. ¹		SAIL.		UNRIGGED.	
	1916	1906	1916	1906	1916	1906	1916	1906
Total:								
Number of vessels.....	21,658	20,032	8,347	5,413	2,539	5,920	10,772	8,699
Gross tonnage.....	6,508,617	4,851,421	2,828,953	1,457,894	803,426	1,132,905	2,876,238	2,260,622
5 to 49 tons:								
Number of vessels.....	7,660	7,413	5,575	3,019	1,229	3,792	856	602
Gross tonnage.....	136,637	133,812	89,833	55,983	24,497	63,191	22,307	14,633
50 to 99 tons:								
Number of vessels.....	1,959	2,129	805	763	307	592	847	774
Gross tonnage.....	138,582	151,754	58,682	55,734	21,071	40,928	58,829	55,092
100 to 199 tons:								
Number of vessels.....	3,635	3,839	602	590	166	299	2,867	2,950
Gross tonnage.....	523,480	549,840	85,381	83,092	23,891	42,889	414,208	423,859
200 to 299 tons:								
Number of vessels.....	2,727	2,127	259	225	104	169	2,364	1,733
Gross tonnage.....	657,183	513,836	62,893	54,840	25,923	41,971	568,367	417,025
300 to 399 tons:								
Number of vessels.....	1,711	1,429	109	107	72	137	1,530	1,185
Gross tonnage.....	581,103	486,094	38,141	37,370	24,835	47,615	518,127	401,109
400 to 499 tons:								
Number of vessels.....	1,324	869	116	115	65	155	1,144	599
Gross tonnage.....	577,888	380,276	50,800	51,113	28,826	69,299	498,262	259,864
500 to 999 tons:								
Number of vessels.....	1,665	1,441	235	249	364	485	1,066	707
Gross tonnage.....	1,123,937	997,370	167,763	176,096	278,460	356,998	676,864	464,276
1,000 to 2,499 tons:								
Number of vessels.....	555	585	241	184	216	262	98	139
Gross tonnage.....	847,013	852,007	402,798	289,359	324,941	380,716	119,274	181,932
2,500 to 4,999 tons:								
Number of vessels.....	279	169	263	131	16	28	.....	10
Gross tonnage.....	968,869	556,311	917,976	429,399	50,982	84,080	.....	42,832
5,000 tons and over:								
Number of vessels.....	143	31	143	30	.....	1	.....	.....
Gross tonnage.....	954,686	230,121	954,686	224,903	.....	5,218	.....	.....

¹ Includes craft propelled by machinery.

Over one-third of all the vessels on the Atlantic and Gulf coasts in 1916 were of less than 50 tons gross register, the total number in this class being 7,660. Of these, 5,575 were steamers, 1,229 sailing vessels, and 856 unrigged craft. There were only 977 vessels, or 4.5 per cent of the total, with a gross register amounting to 1,000 tons or over, and of this number, 647 were steam, 232 sailing vessels, and 98 unrigged craft. The group of steamers showing the greatest increase in number was that with a gross register of less than 50 tons, the increase amounting to 2,556 vessels from 1906 to 1916. Most of these craft were propelled by gasoline engines, such vessels increasing largely in number in later years.

Steamers with a gross register of 1,000 tons or over show large increases in number and tonnage from 1906 to 1916, amounting to 87.5 per cent in number and

141.1 per cent in tonnage. Sailing and unrigged vessels in this class, however, show decreases in both number and tonnage, amounting to 20.3 per cent in number and 20 per cent in tonnage for sailing vessels, and 34.2 per cent in number and 46.9 per cent in tonnage for unrigged craft. This decrease in sailing vessels of large capacity is consistent with the general decrease in all vessels of this class, but in the case of unrigged craft the decrease is confined almost entirely to these large vessels, the only other group showing decreases in number and tonnage being that with a gross register of from 100 to 199 tons. The decrease in this group was slight, however, amounting to only 2.8 per cent in number and 2.3 per cent in tonnage.

Table 20 shows average size and average value per vessel and per ton of metal, wooden, and composite vessels, by class and occupation, for 1916, 1906, and 1889.

TABLE 20.—AVERAGE GROSS TONNAGE AND VALUE PER VESSEL AND AVERAGE VALUE PER TON: 1916, 1906, AND 1889.

CLASS AND OCCUPATION.	Census year.	TOTAL.			METAL.			WOOD.			COMPOSITE.		
		Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.
Total.....	1916	301	\$29,046	\$97	1,569	\$269,295	\$172	187	\$7,590	\$41	303	\$52,147	\$172
	1906	242	13,633	56	1,087	135,693	125	191	6,155	32	216	25,477	118
	1889	217	9,482	44	839	77,470	92	194	6,935	36	273	13,146	48
Steam ¹	1916	339	61,988	183	1,737	321,488	185	52	8,680	168	385	67,508	175
	1906	269	35,826	133	1,094	148,681	136	83	10,319	124	182	31,438	172
	1889	292	25,835	88	843	78,141	93	182	15,339	84	224	22,825	102
Freight and passenger.....	1916	859	153,788	179	3,056	557,411	182	84	11,457	137	792	122,704	155
	1906	687	79,538	116	2,150	264,260	123	173	14,750	85	551	38,000	69
	1889	602	45,066	76	1,353	115,536	85	374	24,491	65	432	28,000	65
Tugs and other towing vessels.....	1916	83	20,389	247	186	51,828	278	55	12,080	219	110	10,971	100
	1906	88	15,322	174	217	37,324	172	58	10,131	176	69	7,500	109
	1889	56	9,318	166	83	15,794	189	53	8,676	163	39	3,633	92
Ferryboats.....	1916	587	55,973	95	923	96,466	105	271	17,879	66	.....	.....	.....
	1906	603	73,965	123	902	125,762	139	338	27,963	83	.....	.....	.....
	1889	459	36,952	81	687	66,720	97	372	25,621	69	.....	.....	.....
Yachts.....	1916	32	9,892	313	285	107,206	376	19	4,960	265	103	32,678	317
	1906	45	13,501	302	340	110,346	325	22	6,071	275	102	32,667	319
	1889	67	20,709	311	195	65,989	339	43	12,225	284	118	45,000	382
Miscellaneous.....	1916	43	10,680	247	302	92,198	305	26	5,099	200	54	8,400	156
	1906	84	15,962	189	399	83,487	209	41	6,811	165	327	50,000	153
	1889	336	27,926	83	1,014	86,161	85	183	14,405	79	92	22,200	242
Sail.....	1916	316	16,909	53	1,291	101,987	79	279	13,624	49	40	7,500	189
	1906	191	6,338	33	1,115	66,892	51	179	5,629	31	230	18,092	79
	1889	206	6,800	33	709	55,754	79	204	6,668	33	292	9,626	33
Freight and passenger.....	1916	401	20,702	52	1,410	106,456	76	355	16,839	47	.....	.....	.....
	1906	262	7,858	30	1,447	62,961	44	244	7,051	29	2,347	118,000	50
	1889	241	7,416	31	1,248	73,500	59	239	7,294	31	323	10,255	32
Yachts.....	1916	21	3,621	176	284	64,000	225	15	2,279	155	40	7,500	189
	1906	15	2,780	179	119	38,684	326	14	2,158	158	38	9,009	238
	1889	23	4,270	186	80	35,050	437	22	3,959	177	24	6,833	285
Miscellaneous.....	1916	36	4,362	120	.....	.....	.....	36	4,362	120	.....	.....	.....
	1906	18	1,586	89	.....	.....	.....	18	1,586	89	.....	.....	.....
	1889	44	2,921	67	.....	.....	.....	44	2,926	67	35	2,438	70
Unrigged.....	1916	267	6,381	24	746	43,366	58	255	5,476	21	279	8,500	30
	1906	260	4,789	18	970	48,254	50	253	4,390	17	948	12,000	13
	1889	182	2,288	13	.....	.....	.....	182	2,288	13	.....	.....	.....

¹ Includes craft propelled by machinery.

Naturally, the vessels of metal construction show a much higher average value than the wooden craft, the average value of the metal vessels per ton in 1916 being \$172, as compared with \$41 for those of wood construction. The average value per ton for composite vessels was the same as those of metal, \$172. All three classes of vessels increased in value per ton from 1906 to 1916.

Only two classes of craft propelled by machinery, the freight and passenger vessels and the tugs, showed increases in average value per vessel during the decade, while all classes of sail vessels and the unrigged craft, as a whole, showed substantial gains in this respect. Ferryboats show the most pronounced decrease in value from 1906 to 1916, due largely to the continuance in the service of many old vessels.

CHARACTER OF PROPULSION AND HORSEPOWER.

Table 21 shows the number, gross tonnage, and horsepower of vessels propelled by machinery, by character of propulsion and kind of power used, for 1916 and 1906.

TABLE 21.—VESSELS PROPELLED BY MACHINERY, BY CHARACTER OF PROPULSION AND KIND OF POWER: 1916 AND 1906.

CHARACTER OF PROPULSION AND POWER.	NUMBER OF VESSELS.		GROSS TONNAGE.		HORSEPOWER OF ENGINES.	
	1916	1906	1916	1906	1916	1906
Total.....	8,347	5,413	2,828,953	1,457,894	2,597,427	1,758,378
Steam.....	3,190	3,434	2,704,461	1,423,750	2,398,058	1,712,382
Gasoline.....	5,157	1,974	124,492	34,072	199,369	45,932
All other.....		5		72		64
Screw.....	7,934	4,858	2,614,349	1,169,305	2,357,339	1,458,521
Steam.....	2,849	2,907	2,491,461	1,135,578	2,160,236	1,413,088
Gasoline.....	5,085	1,946	122,888	33,655	197,103	45,369
All other.....		5		72		64
Side wheel.....	257	370	205,406	270,853	228,275	279,705
Steam.....	256	368	205,387	270,831	228,245	279,675
Gasoline.....	1	2	19	22	30	30
Stern wheel.....	156	183	9,198	17,621	11,813	20,090
Steam.....	85	157	7,613	17,226	9,577	19,557
Gasoline.....	71	26	1,585	395	2,236	533
All other.....		2		115		62
Steam.....		2		115		62

The most significant fact shown in this table is the great increase in vessels using gasoline as the propelling power. This class of craft increased 161.2 per cent in number from 1906 to 1916, while the number of vessels propelled by steam actually decreased 7.1 per cent. However, the gross tonnage of the 5,157 gasoline vessels was equal to only 4.6 per cent of the gross tonnage of the 3,190 steam craft. Likewise, the total horsepower of the craft using gasoline amounted to only 8.3 per cent of the horsepower of the vessels propelled by steam.

Vessels driven by screw propellers constituted 95.1 per cent of the total number in 1916 and 92.4 per cent of the total tonnage. They also reported 90.8 per cent of the total horsepower for all vessels. These vessels showed substantial increases in number, tonnage, and horsepower from 1906 to 1916, while craft equipped with side or stern wheels showed decreases in all three respects during the decade.

Table 22 shows the classification of vessels according to character of propulsion and horsepower of engines, by occupation, for 1916 and 1906.

TABLE 22.—CHARACTER OF PROPULSION AND HORSEPOWER OF VESSELS PROPELLED BY MACHINERY, BY OCCUPATION: 1916 AND 1906.

OCCUPATION.	Census year.	CHARACTER OF PROPULSION.					HORSEPOWER OF ENGINES.			
		Total.	Screw (number).	Side wheel (number).	Stern wheel (number).	All other (number).	Total.	Steam.	Gasoline.	All other.
Total.....	1916	8,347	7,934	257	156		2,597,427	2,398,058	199,369	
	1906	5,413	4,858	370	183	2	1,758,378	1,712,382	45,932	64
Freight and passenger.....	1916	2,798	2,584	131	83		1,719,176	1,669,276	49,900	
	1906	1,623	1,225	194	104		1,003,177	992,963	10,214	
Tugs and other towing vessels.....	1916	1,856	1,781	4	71		435,515	420,729	14,786	
	1906	1,690	1,606	11	73		382,557	381,051	1,506	
Ferryboats.....	1916	262	144	117	1		155,600	154,158	1,442	
	1906	270	111	156	1	2	158,335	158,140	195	
Yachts.....	1916	2,587	2,587				216,781	111,025	105,756	
	1906	1,577	1,573	1	3		142,965	142,203	30,706	56
Miscellaneous.....	1916	844	838	5	1		70,355	42,870	27,485	
	1906	353	343	8	2		41,344	38,025	3,311	8

INCOME.

Table 23 shows the gross income of all vessels (except fishing vessels), by occupation, with per cent of increase, for 1916 and 1906.

The total income for all vessels in 1916, not including that reported by fishing vessels, was \$376,806,060, a gain of \$217,046,136, or 135.8 per cent, over the income reported for 1906. Of the total income in 1916, \$288,158,996, or 76.5 per cent, was derived from freight; of the remainder, \$31,475,454, or 8.4 per cent, was from passengers, and \$57,171,610, or 15.2 per cent, from all other sources. In 1916 the income of the towing vessels and unrigged craft amounted to \$87,689,998, being an increase of \$32,962,002, or 60.2 per cent, since 1906. The income of these tugs and unrigged craft from freight showed an increase of \$30,895,988, or 196.8 per cent, during the period 1906-1916; while the small income from passenger

traffic showed a large proportionate decrease, 80.2 per cent.

TABLE 23.—GROSS INCOME—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS, BY OCCUPATION, WITH PER CENT OF INCREASE: 1916 AND 1906.

OCCUPATION AND CENSUS YEAR.	Total.	Freight.	Passenger.	All other.
Total:				
1916.....	\$376,806,060	\$288,158,996	\$31,475,454	\$57,171,610
1906.....	\$159,759,924	\$83,890,161	\$25,643,332	\$50,226,431
Per cent of increase.....	135.8	243.5	22.7	13.8
Freight and passenger:				
1916.....	\$275,509,040	\$241,563,075	\$24,794,470	\$9,151,495
1906.....	\$92,096,988	\$68,185,461	\$18,208,365	\$5,703,162
Per cent of increase.....	199.2	254.3	36.2	60.5
Towing vessels and unrigged craft:				
1916.....	\$87,689,998	\$46,593,413	\$9,161	\$41,087,424
1906.....	\$54,727,996	\$15,697,425	\$46,254	\$38,984,317
Per cent of increase.....	60.2	196.8	—80.2	5.4
All other:				
1916.....	\$13,607,022	2,508	\$6,671,823	\$6,932,691
1906.....	\$12,934,940	7,275	\$7,388,713	\$5,538,952
Per cent of increase.....	5.2	—65.5	—9.7	25.2

¹ A minus sign (—) denotes decrease.

EMPLOYEES AND SALARIES AND WAGES.

Table 24 gives the number of employees, with their salaries and wages, with per cent of increase, for 1916 and 1906.

TABLE 24.—EMPLOYEES AND SALARIES AND WAGES, WITH PER CENT OF INCREASE: 1916 AND 1906.

	NUMBER OF EMPLOYEES.			SALARIES AND WAGES.		
	1916	1906	Per cent of increase.	1916	1906	Per cent of increase
Total.....	152,561	109,985	38.7	\$84,957,552	\$59,125,132	43.7
On vessels.....	84,978	77,124	10.2	58,902,964	38,352,259	53.6
On land.....	67,583	32,861	105.7	26,054,588	20,772,873	25.4
Officers, managers, clerks, etc.....	13,235	8,500	55.7	10,987,830	7,865,181	39.7
All other.....	54,348	24,361	123.1	15,066,758	12,907,692	16.7

The total number of employees engaged in transportation by water on the Atlantic and Gulf coasts in 1916 was 152,561, and their total salaries and wages amounted to \$84,957,552. When compared with the corresponding totals for 1906, these figures show an increase of 38.7 per cent in the number employed and 43.7 per cent in the amount of salaries and wages paid. Of the total number of employees, those employed on the vessels formed 55.7 per cent and their salaries and wages formed 69.3 per cent of the total.

FREIGHT.

Table 25 shows the different classes of commodities shipped at Atlantic and Gulf ports in 1916 and 1906.

TABLE 25.—FREIGHT SHIPPED, BY COMMODITIES: 1916 AND 1906.

COMMODITY	QUANTITY.	
	1916	1906
Total..... tons ¹	80,259,375	65,360,958
Canned goods..... tons.....	535,372	193,602
Cement, brick, and lime..... tons.....	2,350,779	4,738,177
Coal..... tons.....	23,248,105	19,149,753
Cotton..... tons.....	741,400	793,992
Flour..... tons.....	232,127	104,362
Fruits and vegetables..... tons.....	1,613,586	796,329
Grain..... tons.....	862,378	530,843
Ice..... tons.....	941,648	1,951,188
Iron ore..... tons.....	344,968	18,465
Lumber..... tons.....	5,880,916	6,050,814
Cement, brick, and lime..... M feet.....	(2,988,023)	(2,793,742)
Naval stores..... tons.....	416,360	373,261
Petroleum and other oils..... tons.....	10,358,849	2,670,205
Phosphate and fertilizer..... tons.....	(58,970,191)	(16,840,716)
Pig iron and steel rails..... tons.....	1,279,937	1,187,885
Stone, sand, etc..... tons.....	6,718,929	7,391,354
Tobacco..... tons.....	140,226	165,776
Miscellaneous merchandise..... tons.....	23,875,061	18,580,196

¹ All tons of 2,000 pounds.

The total shipments of all commodities from ports on the Atlantic and Gulf coasts in 1916 amounted to 80,259,375 tons, which was an increase of 14,898,417 tons, or 22.8 per cent, as compared with 1906. In 1916 coal shipments amounting to 23,248,105 tons formed the largest single item of traffic, a condition similar to that in 1906. Petroleum and other oils ranked next to coal with 10,358,849 tons, and stone, sand, etc., was third with 6,718,929 tons. Miscellaneous merchandise, which included all commodities shipped except those specially mentioned in the table, totaled 23,875,061 tons.

The commodities which showed tonnage decreases in water shipments since 1906 were cement, brick, and lime; cotton; ice; lumber; stone, sand, etc.; and tobacco.

Table 26 shows the shipments and receipts of principal commodities in 1916 for each of the principal ports of the Atlantic and Gulf coasts.

TABLE 26.—SHIPMENTS AND RECEIPTS OF PRINCIPAL COMMODITIES, BY PORTS: 1916 AND 1906.

PORT.	Cen- sus year.	TOTAL (TONS OF 2,000 POUNDS).		CANNED GOODS (TONS OF 2,000 POUNDS).		CEMENT, BRICK, AND LIME (TONS OF 2,000 POUNDS).		COAL (TONS OF 2,000 POUNDS).		COTTON (TONS OF 2,000 POUNDS).		FLOUR (TONS OF 2,000 POUNDS).	
		Ship- ments.	Receipts.	Ship- ments.	Re- ceipts.	Ship- ments.	Receipts.	Ship- ments.	Receipts.	Ship- ments.	Re- ceipts.	Ship- ments.	Re- ceipts.
Total.....	1916	80,259,375	80,259,375	535,372	535,372	2,350,779	2,350,779	23,248,105	23,248,105	741,400	741,400	232,127	232,127
	1906	65,360,958	65,360,958	193,602	193,602	4,738,177	4,738,177	19,149,753	19,149,753	793,992	793,992	104,362	104,362
Albany, N. Y.....	1916	181,059	263,043	490	1,810	12,520	150	41,990	12,938	.....	2,070	305	550
	1906	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Baltimore, Md.....	1916	3,293,932	3,766,907	120,015	64,553	53,091	2,777	1,647,061	246,972	8,236	35,235	25,409	474
	1906	3,579,407	1,858,443	49,005	18,640	11,028	21,936	2,274,731	15,026	12,188	51,130	4,546	19
Bangor, Me.....	1916	32,128	355,532	.....	.....	360	3,525	.....	334,452	.....	.....	40	.....
	1906	255,613	319,546	10	.....	.....	9,799	40	262,981	.....	.....	.....	.....
Beaufort, N. C.....	1916	3,437	13,941	118	240	8	.....	150	150	542	32	116	1,500
	1906	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston, Mass.....	1916	1,049,954	9,936,637	15,966	41,189	4,423	22,624	2,999	7,399,014	3,946	127,423	561	531
	1906	887,001	6,533,573	15,156	16,746	2,697	77,707	3,080	4,699,655	48	145,360	1,010	.....
Bridgeport, Conn.....	1916	117,720	1,182,652	.....	.....	.....	6,680	155	862,903	.....	.....	58	.....
	1906	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brunswick, Ga.....	1916	162,175	56,030	121	1,412	280	3,021	74	70	9,105	13	269	411
	1906	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Charleston, S. C.....	1916	373,898	367,706	420	7,635	253	3,880	101,291	28,738	52,912	566	31	3,061
	1906	303,950	414,730	610	581	196	42,553	1,059	83,371	62,882	4,056	310	648
Fall River, Mass.....	1916	387,679	639,649	.....	225	90	2,330	74,650	363,388	.....	.....	300	150
	1906	274,646	786,392	1,400	1,050	420	2,590	.....	570,438	700	14,900	200	1,430
Galveston, Tex.....	1916	1,276,995	898,186	92,499	35,498	1,120	6,837	100	1,505	206,308	23,934	8,129	36
	1906	734,915	960,982	86	14,312	134	13,865	1,795	50,390	137,628	94,278	856	.....
Gulfport, Miss.....	1916	160,677	113,070	.....	2	1,540	378	.....	.....	.....	.....	488	2
	1906	48,061	346,096	25	27	.....	.....	.....	.....	.....	.....	57	4
Jacksonville, Fla.....	1916	839,356	655,884	4,490	6,284	3,067	24,577	1,162	67,039	8,116	.....	2,878	11,526
	1906	661,615	331,951	30	457	10	18,154	350	97,356	1,940	.....	150	1,850
Jersey City, N. J.....	1916	73,687	29,782	20	.....	44,396	.....	4,244	.....	.....	.....	.....	.....
	1906	186,982	167,548	.....	.....	19,735	3,428	117,866	3,789	.....	.....	.....	.....
Key West, Fla.....	1916	283,746	162,217	2	1,221	12,560	1,169	.....	28,362	.....	.....	4,398	1,186
	1906	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mobile, Ala.....	1916	349,632	246,654	675	3,243	2,269	671	45,965	86,382	3,702	416	12,871	20
	1906	260,725	102,533	736	3,038	591	4,814	1,481	4,863	15,383	22,638	2,536	2
New Bedford, Mass.....	1916	205,302	755,615	70	.....	280	2,296	2,514	561,165	.....	.....	34	.....
	1906	163,951	581,176	.....	.....	96	.....	2,020	476,879	.....	.....	78	.....
New Haven, Conn.....	1916	451,408	1,702,236	.....	400	549	14,399	.....	1,433,151	.....	.....	.....	8,400
	1906	161,666	2,156,814	1,500	10,800	600	3,261	.....	1,830,953	.....	.....	200	5,825
New London, Conn.....	1916	250,016	781,670	.....	.....	.....	582	698	424,277	.....	.....	354	102
	1906	240,305	887,404	60	2,405	2,280	8,450	592,555	.....	440	.....	.....	55
New Orleans, La.....	1916	995,617	1,240,150	6,382	21,035	6,189	9,092	4,481	84,370	30,121	463	71,373	18
	1906	741,621	1,182,863	823	1,056	490	21,355	3,419	12,631	45,459	7,885	16,005	.....
New York, N. Y.....	1916	9,472,750	13,151,125	86,045	125,572	296,645	1,474,578	907,025	311,620	71,435	355,539	61,110	5,825
	1906	8,598,374	17,507,906	46,191	22,880	181,425	3,491,267	943,592	502,345	47,289	359,185	37,537	4,029
Norfolk and Newport News, Va.....	1916	13,873,087	3,245,924	2,125	60,073	4,237	42,264	8,839,022	63,304	102,100	21,781	6,845	1,754
	1906	7,680,230	2,808,346	2,973	29,158	29,528	4,081,999	102,521	118,695	.....	3,697	4,973	2,907
Pensacola, Fla.....	1916	99,012	78,798	82	100	1,662	62	3,594	12	5	.....	347	150
	1906	56,130	123,632	329	8	.....	.....	4,156	4,131	.....	36	1,954	.....
Philadelphia, Pa.....	1916	4,221,338	3,252,840	12,619	11,584	18,987	896	2,605,054	8,186	45	5,893	5,527	1,000
	1906	5,213,485	2,721,456	2,580	9,563	6,427	3,562	3,784,825	31,911	754	10,983	4,881	95
Port Arthur, Tex.....	1916	1,877,967	756,740	.....	6,712	463	.....	78	.....	139	.....	.....	.....
	1906	1,052,778	39,363	.....	.....	80	.....	430	.....	.....	.....	.....	.....
Portland, Me.....	1916	220,579	1,528,890	341	1,300	513	439	1,811	1,071,633	18	14,375	1,533	215
	1906	303,295	1,357,316	9,517	1,430	947	8,051	3,138	1,124,065	.....	6,770	1,854	.....
Portsmouth, N. H.....	1916	20,777	224,316	.....	.....	.....	.....	11,977	223,522	.....	.....	.....	.....
	1906	25,390	362,820	.....	.....	19,060	.....	6,130	341,261	.....	.....	.....	.....
Providence, R. I.....	1916	462,239	3,936,714	500	2,378	1,870	11,070	315	3,090,918	31	38,379	356	209
	1906	341,524	2,749,511	1,563	3,834	2,060	13,262	849	2,258,375	11,785	31,064	1,952	.....
Rockland, Me.....	1916	86,693	193,339	562	4,305	43,955	3,748	19,330	100,071	.....	1,008	1,171	745
	1906	175,904	149,496	2	5	124,641	7,833	1,903	76,270	.....	.....	1,385	.....
Savannah, Ga.....	1916	584,914	463,805	1,173	15,191	248	12,529	1,214	36,223	141,104	6,486	205	5,557
	1906	907,397	582,966	1,057	16,487	15	24,714	2,701	130,149	150,352	8,171	520	.....
Tampa and Port Tampa City, Fla.....	1916	358,785	440,352	420	8,247	180	15,687	113	17,311	.....	.....	702	10,196
	1906	372,407	188,692	83	1,155	285	2,082	.....	35,560	.....	.....	844	2,419
Washington, D. C.....	1916	59,813	858,197	3,913	1,885	3,242	16,641	12,808	22,928	.....	.....	100	693
	1906	92,910	599,177	40	1,502	872	2,054	46,962	88,161	.....	.....	20	12
Wilmington, Del.....	1916	60,992	243,019	.....	200	.....	3,064	.....	.....	.....	.....	1,000	500
	1906	95,241	250,188	50	50	990	25	6,985	2,178	.....	.....	50	200
Wilmington, N. C.....	1916	74,812	87,354	1,249	185	2,628	1,378	1,782	519	13,024	903	972	.....
	1906	121,930	145,209	1,018	207	1,719	16,115	242	8,292	159	3,649	3,523	346
All other Atlantic and Gulf ports.....	1916	29,264,866	19,839,309	175,419	78,138	1,833,591	408,063	8,844,199	4,440,221	90,266	68,657	14,375	38,945
	1906	30,235,656	16,803,986	57,417	40,135	4,355,985	899,823	7,842,976	6,457,969	188,581	29,750	18,281	47,106
Ports other than those on the Atlantic and Gulf coasts of the United States.....	1916	9,032,323	8,791,092	9,606	34,755	46	254,909	72,327	1,926,683	245	40,227	10,368	146,653
	1906	1,687,789	2,340,843	501	421	960	18,039	9,004	285,248	149	.....	.....	34,840

TABLE 26.—SHIPMENTS AND RECEIPTS OF PRINCIPAL COMMODITIES, BY PORTS: 1916 AND 1906—Continued.

PORT.	Cen- sus year.	FRUITS AND VEGE- TABLES (TONS OF 2,000 POUNDS).		GRAIN (TONS OF 2,000 POUNDS).		ICE (TONS OF 2,000 POUNDS).		IRON ORE (TONS OF 2,000 POUNDS).		LUMBER (TONS OF 2,000 POUNDS).		NAVAL STORES (TONS OF 2,000 POUNDS).	
		Ship- ments.	Receipts.	Ship- ments.	Re- ceipts.	Ship- ments.	Re- ceipts.	Ship- ments.	Receipts.	Ship- ments.	Re- ceipts.	Ship- ments.	Re- ceipts.
Total.....	1916	1,613,586	1,613,586	862,378	862,378	941,648	941,648	344,968	344,968	5,880,916	5,880,916	416,360	416,360
	1906	796,329	796,329	530,843	530,843	1,951,188	1,951,188	18,465	18,465	6,050,814	6,050,814	373,261	373,261
Albany, N. Y.....	1916	845	1,455	380				53,817		3,404	2,234	5	1,300
	1906												
Baltimore, Md.....	1916	26,298	218,892	13,843	54,069	8,934	20	29,414	118,154	13,507	387,748	4,426	20,495
	1906	3,789	58,293	45,616	52,185	732	47,154	1,767	2,450	10,447	503,351	354	22,758
Bangor, Me.....	1916		25				900			29,476	1,243		
	1906			156	150	43,046				201,817	1,976		
Beaufort, N. C.....	1916	99	242	16	504	5				22	6,740		
	1906												
Boston, Mass.....	1916	98,179	80,488	29,663	21	1,726				9,896	159,271	1,153	42,249
	1906	43,311	69,418	2,809	380		600	736		19,383	299,566	162	24,461
Bridgeport, Conn.....	1916		1,505						710	44	19,248		183
	1906												
Brunswick, Ga.....	1916	81	199	118	900	1,008	49	3		89,664	9,339	25,577	2,228
	1906												
Charleston, S. C.....	1916	624	11,099	162	1,942	1,078	50	2,313	14	95,383	6,981	314	10
	1906	220	12,246	1,897	5,911	53				136,941	5,266	3,398	1,308
Fall River, Mass.....	1916	2,000	1,500	541						580	14,004		
	1906		575	5,490	850	100				3,261	21,288		
Galveston, Tex.....	1916	90,093	12,715	160,424	5,478	541				126,629	45,574	2,847	86
	1906	64,262	26,262	20,279	3,782	25				19,265	21,779		
Gulfport, Miss.....	1916			955	350		325			24,235	100,016	126,321	7,925
	1906	1		232		2				42,703	328,860	100	14,990
Jacksonville, Fla.....	1916	37,540	7,255	7,796	8,072	16		311	6	650,723	4,601		2,386
	1906	51,299	95	500	5,074	60				499,965	3,749	46,137	1,737
Jersey City, N. J.....	1916		58										
	1906			26,126		6	1,057		602	583	1,578		
Key West, Fla.....	1916	6,909	12,079	6,920	1,422	1,150				47,957	3,333	270	10
	1906												
Mobile, Ala.....	1916	339	401	36,206	40	184	38		150	124,456	8,604	20,354	12,152
	1906	410	890	18,937	501	201				147,566	6,635	1,173	1,992
New Bedford, Mass.....	1916	65		645		270				571	19,073		
	1906			80		30	5,714			20,934	17,990		
New Haven, Conn.....	1916		1,288								12,871		200
	1906	350	10,450				1,769		750	416	48,230	600	300
New London, Conn.....	1916	236	383	744	151					2,253	14,908		
	1906		380	379	44	73	1,489			1,496	13,564		
New Orleans, La.....	1916	16,674	202,023	146,863	2,393	1,366		125		180,968	69,129	3,421	135
	1906	15,707	22,079	62,204	50	1,970				55,263	148,176	24	15,475
New York, N. Y.....	1916	92,440	363,272	206,039	205,746	33,967	527,721	1,448	410	60,803	1,278,125	12,556	167,529
	1906	105,927	319,304	97,372	59,560	50	1,758,179	404	824	129,556	2,393,694	7,822	142,724
Norfolk and Newport News, Va.....	1916	188,502	282,421	2,639	3,260	924	10	33,005	3,080	2,398,247	28,079	7,089	617
	1906	105,675	71,433	4,449	8,977	372	12,330	3,018	636	446,628	122,378	4,796	767
Pensacola, Fla.....	1916	328	96	9,530	1,148	30			20	61,859	19,890	6,351	29,656
	1906	39		16,907		505				19,658	82,561	1,686	27,257
Philadelphia, Pa.....	1916	16,583	17,759	9,856	6,257	100		600	66,105	3,330	350,950	804	29,496
	1906	9,528	66,469	47,491	6,069	1,965	36,640	235		9,402	655,017	142	29,551
Port Arthur, Tex.....	1916				1,205					22,602			
	1906		72							33,460	33,253		
Portland, Me.....	1916	4,539	4,805	5,808	1,115					9,983	17,041	13	529
	1906	5,455		8,253		9,772			3	31,782	27,788	1,590	720
Portsmouth, N. H.....	1916												
	1906					200					231		
Providence, R. I.....	1916	6,228	5,214	7,563					2,313	457	17,202		746
	1906	1,653	6,420	1,410	558	350	5,599			3,103	55,650	5	533
Rockland, Me.....	1916	190	3,265	3,228	1,750					1,184	3,010	7	
	1906	4	475	3,845	90	1,451				3,585	11,028	50	
Savannah, Ga.....	1916	850	150	455	6,621					64,452	9,738	82,269	358
	1906	23,144	7,995	2,103	60,066	10				448,930	5,397	105,913	5,947
Tampa and Port Tampa City, Fla.....	1916	5,855	1,545	2,941	63,429	6,220	10			50,045	1,712	2,091	30
	1906	1,632	4,204	2,944	5,858	54	1,716			36,607	1,069	3,812	4,108
Washington, D. C.....	1916	1,962	2,180	3,090	450	400	1,400				2,276	21,122	
	1906	330	783	8	542	6,800	24,306			1,866	41,452		
Wilmington, Del.....	1916	150	17,000	25	1,169						810		
	1906	100	12,800	25	3,304						6,693		
Wilmington, N. C.....	1916	66	327	1,340	317	581	12			24,997	2,198	4,293	2,828
	1906	70	1,042	4,992	1,919	276	10	1,300		62,586	9,834	13,949	10,852
All other Atlantic and Gulf ports.....	1916	522,672	189,555	153,706	112,779	883,148	409,983	86,841	144,754	1,604,867	2,678,298	116,689	70,973
	1906	262,215	90,894	150,213	182,840	1,883,085	50,099	10,455		3,426,097	894,276	181,548	67,406
Ports other than those on the Atlantic and Gulfoasts of the United States..	1916	493,339	174,395	50,912	381,790		1,130	135,791	9,252	195,986	566,924	10	24,339
	1906	101,208	13,840	5,976	123,133		4,436	1,850	741	237,614	288,485		375

TABLE 26.—SHIPMENTS AND RECEIPTS OF PRINCIPAL COMMODITIES, BY PORTS: 1916 AND 1906—Continued.

PORT.	Cen- sus year.	PETROLEUM AND OTHER OILS (TONS OF 2,000 POUNDS).		PHOSPHATE AND FERTILIZER (TONS OF 2,000 POUNDS).		PIG IRON AND STEEL RAILS (TONS OF 2,000 POUNDS).		STONE, SAND, ETC. (TONS OF 2,000 POUNDS).		TOBACCO (TONS OF 2,000 POUNDS).		MISCELLANEOUS MERCHANDISE (TONS OF 2,000 POUNDS).	
		Ship- ments.	Re- ceipts.	Ship- ments.	Re- ceipts.	Ship- ments.	Re- ceipts.	Ship- ments.	Re- ceipts.	Ship- ments.	Re- ceipts.	Ship- ments.	Re- ceipts.
Total.....	1916 1906	10,358,849 2,670,205	10,358,849 2,670,205	1,279,937 1,187,883	1,279,937 1,187,883	718,734 664,758	718,734 664,758	6,718,929 7,391,354	6,718,929 7,391,354	140,226 165,776	140,226 165,776	23,875,061 18,580,196	23,875,061 18,580,196
Albany, N. Y.....	1916 1906	88 167,927	137,236 304,632	..... 246,324	1,000 312,994	7,404 27,624	..... 5,522	2,870 18,423	40,533 1,136,223	250 31,399	770 49,546	56,691 852,001	60,997 808,601
Baltimore, Md.....	1916 1906	83,921 71,154	..... 251,641	..... 107,286	..... 94,979	..... 22,458	..... 2,022	..... 60,805	..... 1,343	..... 48,142	..... 731,298	..... 695,657	..... 14,183
Bangor, Me.....	1916 1906	34 19,200	..... 2,536	..... 1,450	..... 106	..... 4,655	..... 106	..... 4,655	..... 106	..... 4,655	..... 106	..... 10,364	..... 16,799
Beaufort, N. C.....	1916 1906	705 57,056	2,174 348,660	202 8,689	100 1,964	..... 99,331	..... 38,145	50 25,736	..... 561,352	1 336	..... 8,980	1,403 690,294	2,259 1,084,726
Boston, Mass.....	1916 1906	9,192 158,442	..... 42,873	..... 12,515	..... 653	..... 32,849	..... 2,853	..... 239,462	..... 83,231	..... 244	..... 8,404	..... 742,794	..... 718,008
Bridgeport, Conn.....	1916 1906	..... 24,286	..... 2,013	..... 1,429	..... 16,005	..... 16,005	..... 16,005	..... 16,005	..... 16,005	..... 16,005	..... 16,005	..... 116,092	..... 166,830
Brunswick, Ga.....	1916 1906	83 372	635 56,179	44 7,808	..... 19,804	2,978 12,220	..... 5,471	27 18,403	4,900 9,664	9 1	..... 250	32,754 80,413	32,853 212,362
Charleston, S. C.....	1916 1906	961 73	11,338 4,450	29,210	30,653 .....	..... 200	..... 2,950	199 10,000	28,609 12,702	9 200	..... 200	66,005 309,518	188,190 250,491
Fall River, Mass.....	1916 1906	..... 73	..... 4,450	..... 200	..... 2,950	..... 2,950	..... 2,950	..... 2,950	..... 2,950	..... 2,950	..... 2,950	..... 253,002	..... 152,769
Galveston, Tex.....	1916 1906	40,375 7,417	125,816 39,562	350 61	1,647 1,200	406 257	21,793 161,462	58 52,003	71,586	44 402	345	547,572 430,445	618,569 462,057
Gulfport, Miss.....	1916 1906	..... 7	..... 146	..... 2,098	..... 1,125	..... 80	..... 1,019	..... 11,099	..... 5,507	..... 408	..... 356	..... 101,425	..... 242,814
Jacksonville, Fla.....	1916 1906	8,177 3,097	261,025 15,424	2,098 420	13,417 4,800	80	1,019 2,212	11,099	5,507	408 573	356	101,425 57,184	242,814 181,043
Jersey City, N. J.....	1916 1906	..... 225	..... 90	..... 100	..... 1,501	6,247 18,702	112 1,000	..... 2,950	26,117 149,591	..... .....	..... .....	18,780 689	3,500 4,912
Key West, Fla.....	1916 1906	121	48,976	16,745	2,557	18,115 .....	..... .....	891	149,591	734	876	166,974	61,026
Mobile, Ala.....	1916 1906	1,842 99	40,540 403	1,572 15,612	719 21,200	3,070 20	..... 90	1,868 6,286	400	6 57	22 55	94,253 49,637	92,856 35,412
New Bedford, Mass.....	1916 1906	499 80	7,965 1,311	..... .....	..... .....	..... .....	600 .....	..... .....	48,400 2,002	2 .....	..... .....	200,352 140,633	116,116 77,280
New Haven, Conn.....	1916 1906	..... 191	23,179 3,607	..... 370	500 1,239	..... 37,445	2,449	306,119 28,682	9,126	200 600	200 2,000	144,740 156,839	204,473 168,928
New London, Conn.....	1916 1906	133 596	15,284 4,905	125 257	..... 430	..... 20	..... 200	5,469 1,950	..... .....	..... 6	..... 5	240,004 226,449	325,923 269,227
New Orleans, La.....	1916 1906	76,546 25,983	145,447 73,398	12,329 2,827	16,642 5,308	5,578 1,431	648 15,403	180	6,699 551,827	929 560	122 50	432,092 508,766	681,934 308,170
New York, N. Y.....	1916 1906	728,751 270,619	585,634 692,482	115,674 108,585	16,656 16,500	212,617 265,663	2,062 91,584	45,885 1,609,264	1,433,057 3,184,477	15,718 10,331	20,838 88,707	6,534,592 4,736,747	6,278,941 4,380,165
Norfolk and Newport News, Va.....	1916 1906	82,926 4,150	157,699 14,215	88,370 33,737	171,772 181,479	235,671 224,485	8,222 12,377	1,120 1,075	164,246 153,210	44,765 99,860	1,925 5,532	1,835,510 2,539,080	2,235,517 2,057,201
Pensacola, Fla.....	1916 1906	683 497	716	1,166 415	..... 53,180	50 12,695	..... 28,868	10 7,571	..... 385,279	24 37	1 3	23,291 9,813	26,947 9,636
Philadelphia, Pa.....	1916 1906	597,195 211,531	1,275,886 414,451	44,553 66,390	53,180 49,228	12,695	28,868 42,851	7,571 35,592	385,279 324,506	441 517	171 427	885,378 1,031,225	1,011,330 1,040,133
Port Arthur, Tex.....	1916 1906	1,841,972 1,011,164	479,272 .....	..... .....	..... .....	..... .....	3,361 2,133	..... .....	182,020 .....	..... .....	..... .....	13,254 8,154	83,629 3,395
Portland, Me.....	1916 1906	2,098 609	105,244 14,430	935 298	2,044 2,901	124 400	211 2,500	1,903 525	18,835 32,189	62 1,545	450 200	190,898 227,610	290,654 136,269
Portsmouth, N. H.....	1916 1906	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	..... 8,800	..... 494
Providence, R. I.....	1916 1906	10,167 1,991	314,455 8,794	379 471	2,045 673	..... 2,950	38,756 48,038	117 3,094	10,235 33,014	1,435 1,811	434,056 307,727	401,356 281,886	.....
Rockland, Me.....	1916 1906	478 830	7,264 169	17 50	286 25	3	42 260	2,571 10,936	22,457 10,737	33	107	13,964 27,222	44,381 42,604
Savannah, Ga.....	1916 1906	3,690 140	25,920 13,250	6,153 7,449	27,996 44,075	53,379 29,303	6,360 1,326	36,498 .....	..... 55	2,238 1,736	4,073 638	190,986 134,024	306,603 255,696
Tampa and Port Tampa City, Fla.....	1916 1906	8,090 420	194,413 83,369	236,990 273,598	1,356	69 784	..... 1,800	26 4,770	52,000	1,234 2	3,003 2,916	43,809 50,386	71,413 38,682
Washington, D. C.....	1916 1906	1,512 17	58,417 26,093	2,900 367	5,093 .....	..... .....	22,779 4,431	3,440 296,930	636,681	1,391 .....	..... .....	22,779 31,197	90,707 117,252
Wilmington, Del.....	1916 1906	50 2	15,957 23,848	200 200	125 100	..... .....	..... 15,507	161 131,341	699	100 75	..... 75	203,395 71,332	203,395 69,574
Wilmington, N. C.....	1916 1906	1,925 378	31,470 25,282	5,756 12,330	6,919 21,276	470 .....	..... .....	..... 1,434	..... .....	15 42	5	14,414 19,746	40,292 44,951
All other Atlantic and Gulfports.....	1916 1906	3,520,738 1,030,653	3,930,772 780,904	433,235 328,599	521,223 612,487	14,344 21,327	167,130 177,037	6,169,525 5,627,512	1,846,183 2,043,103	18,126 18,949	4,987 6,102	4,783,125 4,831,763	4,728,648 5,411,686
Ports other than those on the Atlantic and Gulfoasts of the United States.....	1916 1906	3,204,650 5,328	1,622,532 139,488	45,923 12,023	95,667 8,700	4,830 4,588	371,958 8,529	58,909 4,999	7,283 2,884	22,060 28,407	41,664 609	4,727,321 1,175,192	3,090,931 1,411,175

This table comprises the Atlantic and Gulf coastwise movements, and also the relatively small amount of freight traffic between the ports of the Atlantic and Gulf coasts and the ports of Porto Rico, the Pacific coast, Hawaii, and foreign ports combined. As this table is restricted to the freight carried in American vessels, the total receipts and shipments necessarily equal each other. The total freight carried between the ports as named in the table was 80,259,375 tons of 2,000 pounds.

The shipments in the vessels of the Atlantic coast and Gulf of Mexico from ports not on the Atlantic and Gulf coasts amounted to 9,032,323 tons. The difference between the two amounts, 71,227,052 tons, represented the amount of strictly coastwise traffic, and showed an increase of 7,453,883 tons, or 11.6 per cent, over the corresponding figures for 1906. By a similar process it is shown that the total receipts at the ports of the Atlantic and Gulf coasts amounted to 71,468,283 tons, or a gain of 13.4 per cent, during the decade.

Of the 33 ports for which figures are given separately in Table 26, New York naturally shows the largest amount of commerce (shipments and receipts) for 1916, amounting in that year to 14.1 per cent of the total commerce of all ports of the Atlantic and Gulf coasts. Nevertheless the total commerce of this great port, which amounted to 22,623,875 tons, showed a decrease of 13.3 per cent as compared with 1906. This falling off in commerce was in the receipts, as the shipments showed a gain of 10.2 per cent over the figures for 1906. Norfolk and Newport News, ranking second, with a total commerce of 17,119,021 tons, made the largest gain, 63.2 per cent, during the ten-year period. Boston ranked third in total shipments and receipts

and showed an increase of 48.1 per cent from 1906 to 1916. Other ports with total shipments and receipts in excess of 2,000,000 tons in 1916, showing increases since 1906, were Baltimore, with a gain of 29.8 per cent; Providence, 42.3 per cent; Port Arthur, 141.2 per cent; New Orleans, 16.2 per cent; and Galveston, 28.3 per cent.

Many ports showed a great difference in the shipments and the receipts, New York having almost one-and-a-half times the tonnage of receipts as of shipments. Norfolk and Newport News, on the other hand, showed more than four times the tonnage of shipments as of receipts. Boston's receipts amounted to almost ten times the shipments. The excess of shipments at Norfolk and Newport News and Philadelphia is due to the large shipments of coal to northern ports, where the excess of receipts would be explained by the arrival of these coal cargoes.

In the shipments of the commodities shown in Table 26, the ports of Norfolk and Newport News held first place in five, namely, coal, fruits and vegetables, lumber, pig iron and steel rails, and tobacco; Baltimore, first place in the shipments of canned goods and phosphate and fertilizer; Galveston, in cotton; New Orleans, flour; Albany, iron ore; New York, grain, with Galveston second; Gulfport, Miss., naval stores, with Savannah second; Port Arthur, Tex., petroleum. New York held first place also in miscellaneous merchandise, by a large margin.

TRAFFIC AT AND ABOUT NEW YORK CITY.

Table 27 shows the total traffic of the 11 ports, of which New York is the immediate center, in detail for 1916.

TABLE 27.—SHIPMENTS AND RECEIPTS OF PRINCIPAL COMMODITIES AT BAYONNE, ELIZABETHPORT, HOBOKEN, JERSEY CITY, NEWARK, NEW YORK, PERTH AMBOY, PORT JOHNSON, PORT READING, SOUTH AMBOY, AND WEEHAWKEN: 1916.

COMMODITY.	TOTAL.		BAYONNE.		ELIZABETHPORT.		HOBOKEN.		JERSEY CITY.		NEWARK.	
	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).
Total.....	16,535,546	14,210,999	721,890	594,400	312,794	176,467	180,065	42,550	73,687	29,782	7,190	200,212
Canned goods.....	86,065	125,572							20			
Cement, brick, and lime.....	351,357	1,485,790					7,196	10,640	44,396			572
Coal.....	7,073,783	326,260	1,016		296,724	765	142,350	5,514	4,244			6,075
Cotton.....	71,435	353,539										
Flour.....	61,110	5,825										
Fruits and vegetables.....	92,440	363,325								53		
Grain.....	231,749	205,746					25,710					
Ice.....	33,967	527,721										
Iron ore.....	1,448	139,197				138,787						
Lumber.....	50,843	1,281,600						961			40	366
Naval stores.....	12,556	167,529										
Petroleum and other oils.....	1,444,605	1,127,073	713,788	541,439								
Phosphate and fertilizer.....	123,809	16,656										
Pig iron and steel rails.....	218,880	2,174	16						6,247	112		
Stone, sand, etc.....	59,697	1,755,299		50,000		30,754		25,000		26,117		187,679
Tobacco.....	15,718	20,838										
Miscellaneous merchandise.....	6,606,084	6,306,855	7,070	2,961	16,070	6,161	4,809	435	13,780	3,500	7,150	5,520

TABLE 27.—SHIPMENTS AND RECEIPTS OF PRINCIPAL COMMODITIES AT BAYONNE, ELIZABETHPORT, HOBOKEN, JERSEY CITY, NEWARK, NEW YORK, PERTH AMBOY, PORT JOHNSON, PORT READING, SOUTH AMBOY, AND WEEHAWKEN: 1916.—Continued.

COMMODITY.	NEW YORK.		PERTH AMBOY.		PORT JOHNSON.		PORT READING.		SOUTH AMBOY.		WEEHAWKEN.	
	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).
Total.....	9,472,750	13,151,125	1,520,820	9,154	484,175	.....	1,340,357	4,210	2,167,122	.....	254,696	3,099
Canned goods.....	86,045	125,572	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cement, brick, and lime.....	296,645	1,474,578	3,120	.....	.....	.....	.....	.....	.....	.....	.....	.....
Coal.....	907,025	311,620	1,500,578	2,286	484,175	.....	1,320,442	.....	2,162,533	.....	254,696	.....
Cotton.....	71,435	353,539	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Flour.....	61,110	5,825	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fruits and vegetables.....	92,440	363,272	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grain.....	206,039	205,746	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ice.....	33,967	527,721	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron ore.....	1,448	410	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lumber.....	50,803	1,278,125	.....	805	.....	.....	.....	.....	.....	.....	.....	1,343
Naval stores.....	12,556	167,529	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Petroleum and other oils.....	728,751	585,634	2,066	.....	.....	.....	.....	.....	.....	.....	.....	.....
Phosphate and fertilizer.....	115,674	16,656	.....	.....	.....	.....	6,570	.....	1,565	.....	.....	.....
Pig iron and steel rails.....	212,617	2,062	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stone, sand, etc.....	45,885	1,433,057	8,247	2,692	.....	.....	5,250	.....	315	.....	.....	.....
Tobacco.....	15,718	20,838	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miscellaneous merchandise.....	6,534,592	6,273,941	6,809	3,371	.....	.....	8,095	4,210	2,709	.....	.....	1,756

In this table the shipments and receipts of freight at the ports of Bayonne, Elizabethport, Hoboken, Jersey City, Newark, Perth Amboy, Port Johnson, Port Reading, South Amboy, and Weehawken are considered as part of the traffic of the port of New York, and the figures show the total shipments and receipts at these 10 ports, together with those of New York. The total commerce of the 10 ports and New York amounted to 16,535,546 tons in shipments, and to 14,210,999 tons in receipts. Of this total, the 10 ports outside of New York contributed 42.7 per cent of the shipments and 7.4 per cent of the receipts. South Amboy, Perth Amboy, and Port Reading led in shipments of coal, these 3 ports contributing 70.5 per cent of the total. The commodities, coal, petroleum, and miscellaneous merchandise comprised 91.5 per cent of the total shipments, while cement, brick

and lime, lumber, petroleum, and general merchandise comprised 71.8 per cent of the total receipts of New York and the 10 adjacent ports. In addition to the freight shipped from and received at these 11 ports, there was a total of 80,491,212 tons of freight lightered in the harbor, an increase of 46 per cent since 1906. Adding this amount to the total shipments and receipts gives a total of 111,237,757 tons, which represents the entire freight traffic of the port of New York, exclusive of the tonnage of the export and import traffic in foreign vessels, and shows a gain of 25 per cent over the figures for 1906.

IMPORTS AND EXPORTS.

Table 28 shows, by customs districts, the value of the imports and exports handled at the Atlantic and Gulf ports for the fiscal year ended June 30, 1916.

TABLE 28.—TOTAL VALUE OF IMPORTS AND EXPORTS OF MERCHANDISE, BY CUSTOMS DISTRICTS, YEAR ENDING JUNE 30, 1916.¹

CUSTOMS DISTRICT.	AGGREGATE.		IMPORTS.		EXPORTS.	
	Value.	Per cent of group.	Value.	Per cent of group.	Value.	Per cent of group.
Atlantic and Gulf coasts districts.....	\$5,196,884,992	.....	\$1,672,333,704	.....	\$3,524,551,288	.....
Atlantic coast districts.....	4,601,326,904	100.0	1,562,179,535	100.0	3,039,147,369	100.0
Connecticut.....	3,448,911	0.1	3,448,911	0.2	.....	.....
Georgia.....	47,673,438	1.0	1,777,700	0.1	45,895,738	1.5
Maine and New Hampshire.....	33,708,172	0.7	10,238,421	0.7	23,464,751	0.8
Maryland.....	208,512,290	4.5	27,808,918	1.8	180,703,374	5.9
Massachusetts.....	342,130,189	7.4	210,900,243	13.5	131,229,946	4.3
New York.....	3,524,152,195	76.6	1,191,865,982	76.3	2,332,286,213	76.7
North Carolina.....	14,275,284	0.3	1,195,616	0.1	13,079,668	0.4
Philadelphia.....	289,296,471	6.3	95,801,175	6.1	193,495,296	6.4
Porto Rico.....	8,693,337	0.2	3,058,400	0.2	5,634,937	0.2
Rhode Island.....	1,656,846	(²)	1,647,243	0.1	9,603	(²)
South Carolina.....	7,747,143	0.2	1,740,295	0.1	6,006,848	0.2
Virginia.....	120,037,628	2.6	12,696,633	0.8	107,340,995	3.5
Gulf coast districts.....	595,558,088	100.0	110,154,169	100.0	485,403,919	100.0
Florida.....	32,451,926	5.4	6,920,771	6.3	25,531,155	5.3
Galveston.....	197,931,420	33.2	7,682,793	7.0	190,248,627	39.2
Mobile.....	29,786,126	5.0	4,196,252	3.8	25,589,874	5.3
New Orleans.....	301,544,313	50.6	90,045,564	81.7	211,498,749	43.6
Sabine.....	33,844,303	5.7	1,308,819	1.2	32,535,484	6.7

¹ Bureau of Foreign and Domestic Commerce, Department of Commerce, "Commerce and Navigation of the United States," 1916.

² Less than one-tenth of 1 per cent.

The value of the foreign trade of the Atlantic ports amounted to \$4,601,326,904 and that of the Gulf ports to \$595,558,088, or in the proportion of about eight to one. The aggregate value, \$5,196,884,992, represented an increase of 111.3 per cent over that of 1906. Of this total, 67.8 per cent represented exports and 32.2 per cent imports. The district of New York alone reported 76.6 per cent of the total foreign commerce for the Atlantic coast, and 67.8 per cent of the total for the Atlantic and the Gulf coasts combined. In the import trade the district of New York reported 71.3 per cent of the total value for the Atlantic and Gulf coasts, and in the export trade New York had 66.2 per cent of the total. The district of Massachusetts, which includes the port of Boston, reporting less than one-tenth as much as New York, ranked second in foreign commerce, and the district of New Orleans was third. In respect to the export trade alone, the districts of New York, New Orleans, Philadelphia, Galveston, and Maryland outranked Massachusetts, which was sixth.

PASSENGERS TRANSPORTED.

Table 29 shows the number of passengers carried in coastwise traffic on the Atlantic and Gulf coasts, for 1916, 1906, and 1889.

TABLE 29.—NUMBER OF PASSENGERS: 1916, 1906, AND 1889.

CLASS OF PASSENGERS.	1916	1906	1889	PER CENT OF INCREASE. 1	
				1906-1916	1889-1916
Total.....	237,345,627	292,555,416	170,225,458	-18.9	39.4
Ferry.....	218,045,127	272,596,670	158,644,012	-20.0	37.4
All other.....	19,300,500	19,958,746	11,581,446	-3.3	66.7

1 A minus sign (—) denotes decrease.

The total number of passengers transported on the Atlantic and Gulf coasts in 1916 showed a marked decrease when compared with the figures for 1906. The passenger traffic consists of two distinct classes, ferry passengers, and steamer passengers. The ferry passengers outnumbered the steamer passengers about 11 to 1, and in 1916 totaled 218,045,127 as compared with 19,300,500 for all other passenger traffic. The decrease in the total number of passengers carried, mostly on ferries, explained in the section on ferries, amounted to 18.9 per cent between the years 1906 and 1916, while, on the other hand, for the period 1889-1916 the traffic showed an increase of 39.4 per cent.

Table 30 shows the number of passengers as reported by the Steamboat Inspector General for the fiscal year ending June 30, 1916.

TABLE 30.—PASSENGERS REPORTED FOR EACH DISTRICT OF THE UNITED STATES STEAMBOAT INSPECTION SERVICE ON THE ATLANTIC COAST AND GULF OF MEXICO, FOR FISCAL YEAR ENDING JUNE 30, 1916.¹

LOCAL INSPECTION DISTRICT.	Number of passengers.	LOCAL INSPECTION DISTRICT.	Number of passengers.
Total.....	233,806,293	Mobile, Ala.....	175,288
Albany, N. Y.....	3,293,266	New Haven, Conn.....	475,413
Apalachicola, Fla.....	271,542	New London, Conn.....	961,977
Baltimore, Md.....	2,619,786	New Orleans, La.....	5,985,276
Bangor, Me.....	298,481	New York, N. Y.....	148,162,223
Boston, Mass.....	21,148,103	Norfolk, Va.....	5,307,189
Charleston, S. C.....	597,379	Philadelphia, Pa.....	38,635,337
Galveston, Tex.....	67,634	Portland, Me.....	1,945,453
Jacksonville, Fla.....	1,309,192	Providence, R. I.....	1,943,017
		Savannah, Ga.....	609,737

¹ Annual report of the Steamboat Inspector General.

Although the total number of passengers transported in 1916, as reported by the United States Steamboat-Inspection Service, differs somewhat from the census total in Table 29, there is no greater variation than might be expected when the different methods of obtaining the information are taken into consideration. The figures of the total number of passengers carried in 1916, as reported by the Steamboat-Inspection Service, were 233,806,293, and included those reported from the principal cities on the Atlantic and Gulf coasts. In this list of cities New York led all others, with a total of 148,162,223 passengers transported in 1916. This was 63.4 per cent of the total. Philadelphia ranked second, Boston third, and New Orleans fourth. The great majority of the passengers reported by these cities were ferry passengers, notably so in New York, Philadelphia, and Boston.

IDLE VESSELS.

Table 31 shows the number, gross tonnage, and value of idle vessels, by classes, for 1916 and 1906.

TABLE 31.—IDLE VESSELS: 1916 AND 1906.

CLASS AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Value of vessels.
Total:			
1916.....	1,516	176,743	\$22,490,777
1906.....	1,074	87,254	6,895,147
Steam: ¹			
1916.....	993	115,545	20,086,699
1906.....	450	49,131	5,801,871
Sail:			
1916.....	270	13,890	900,444
1906.....	475	11,971	780,405
Unrigged:			
1916.....	253	47,308	1,503,634
1906.....	149	26,152	312,871

¹ Includes craft propelled by machinery.

Vessels that were not in service at any time during the year 1916 were considered as idle and were not included in the general tables. In 1916 they numbered 1,516 as compared with 1,074 in 1906, an increase of 41.2 per cent. Most of these vessels were small craft,

1,096 of them being under 50 tons. About two-thirds of the total number of idle vessels in 1916 consisted of steamers, this class showing an increase from 450 in 1906 to 993 in 1916, or 120.7 per cent. The sail craft made a better showing, as the number of idle vessels decreased from 475 in 1906 to 270 in 1916, or 43.2 per cent.

Table 32 shows, by classes, the idle vessels grouped according to gross tonnage for 1916.

TABLE 32.—IDLE VESSELS GROUPED ACCORDING TO GROSS TONNAGE: 1916.

TONNAGE.	Total.	Steam.	Gasoline.	Sail.	Unrigged.
Total:					
Number of vessels.....	1,516	292	701	270	253
Gross tonnage.....	176,743	101,094	14,451	13,890	47,308
5 to 49 tons:					
Number of vessels.....	1,096	128	678	224	66
Gross tonnage.....	17,958	3,613	9,706	3,342	1,297
50 to 99 tons:					
Number of vessels.....	137	59	21	26	31
Gross tonnage.....	9,864	4,500	1,391	1,807	2,166
100 to 199 tons:					
Number of vessels.....	120	43	1	10	66
Gross tonnage.....	16,806	6,388	101	1,393	8,924
200 to 299 tons:					
Number of vessels.....	33	9		3	21
Gross tonnage.....	7,999	2,180		723	5,096
300 to 399 tons:					
Number of vessels.....	42	10		1	31
Gross tonnage.....	13,872	3,557		323	9,992
400 to 499 tons:					
Number of vessels.....	27	6		2	19
Gross tonnage.....	11,995	2,790		972	8,233
500 to 999 tons:					
Number of vessels.....	31	12		2	17
Gross tonnage.....	18,930	8,306		1,424	9,200
1,000 to 2,499 tons:					
Number of vessels.....	19	15		2	2
Gross tonnage.....	34,658	28,352		3,906	2,400
2,500 to 4,999 tons:					
Number of vessels.....	9	8	1		
Gross tonnage.....	31,575	28,322	3,253		
5,000 tons and over:					
Number of vessels.....	2	2			
Gross tonnage.....	13,086	13,086			

PORTO RICAN COMMERCE.

Table 33 shows the statistics for the American vessels operating locally at Porto Rico in 1916 and 1906.

TABLE 33.—VESSELS OPERATING LOCALLY AT PORTO RICO: 1916 AND 1906.

	Total.	Steam. ¹	Sail.	Unrigged.
Number of vessels:				
1916.....	320	19	65	236
1906.....	205	4	43	158
Gross tonnage:				
1916.....	11,943	968	1,822	9,153
1906.....	5,566	94	905	4,567
Value of vessels:				
1916.....	\$607,708	\$155,850	\$143,122	\$308,736
1906.....	\$180,519	\$29,200	\$43,175	\$108,144
Gross income:				
1916.....	\$478,802	\$168,023	\$138,350	\$172,429
1906.....	\$227,031	\$7,600	\$42,258	\$177,173
Number employed on vessels:				
1916.....	769	110	203	456
1906.....	603	16	132	455
Wages:				
1916.....	\$211,608	\$55,630	\$55,366	\$100,612
1906.....	\$121,533	\$5,381	\$24,861	\$91,291
Number of passengers carried:				
1916.....	806,683	805,135	1,548	
1906.....	2,400		2,400	
Freight carried ² (tons of 2,000 pounds):				
1916.....	68,077	15,803	49,956	2,318
1906.....	24,120		24,120	

¹ Includes craft propelled by machinery.

² Does not include harbor work amounting to 430,493 tons in 1916 and 258,747 tons in 1906.

This fleet provides transportation for the island ports and markets, and also collects and distributes the traffic carried by the lines plying between Porto Rico and the Atlantic ports of the United States. The number of craft thus employed showed an increase from 205 in 1906 to 320 in 1916, or 56.1 per cent, and an increase in tonnage of 114.6 per cent. The total value of the vessels showed an increase of 236.6 per cent, and the gross income an increase of 110.9 per cent. The passenger traffic also showed a large increase from 2,400 passengers carried in 1906 to 806,683 carried in 1916.

VESSELS ENGAGED IN FOREIGN COMMERCE.

Table 34 shows the number and tonnage of American vessels engaged in foreign commerce from Atlantic and Gulf ports, as compared with foreign craft so engaged, with the percentage of the tonnage furnished by American vessels for 1916.

That American shipping is making gains in foreign trade is shown by the records of arrivals and clearances at the different ports. In 1916, 4,948 American vessels, with a total tonnage of 7,257,092, entered Atlantic and Gulf coast ports, which was an increase of 99.4 per cent for the number of vessels and 175.9 per cent for the amount of tonnage as compared with 1906. In the clearances also the American craft gained 102.5 per cent in the number of vessels and 182.7 per cent in the total tonnage since 1906. The number of American vessels (both steam and sail) that entered these ports in 1916 was 29 per cent of the total, as compared with 17.3 per cent in 1906, while the number of American vessels clearing was 29.2 per cent of the total, as compared with 17.9 per cent in 1906. In 1916, 22.7 per cent of the tonnage entered at Atlantic and Gulf ports, and 22.8 per cent of the tonnage cleared at these ports were American. These figures show substantial increases since 1906, when the percentages were 10.8 for entrances and 11.1 for clearances.

In every customs district, with the exception of Florida and New Orleans, the percentage of the tonnage of American vessels entering and clearing in Atlantic and Gulf ports was higher for the sailing craft than for the steamers. The customs districts of Florida and Connecticut showed the highest percentages of American sailing and steam tonnage entering the ports of those districts, 67.9 and 66.1 per cent, respectively, while the districts of Florida and Rhode Island showed the highest percentages of clearances, 66.2 and 63 per cent, respectively. The high percentage of the Florida district was due probably to the extensive trade between Cuba, and Key West and Tampa.

TABLE 34.—VESSELS ENTERED AND CLEARED IN THE FOREIGN TRADE, BY CUSTOMS DISTRICTS: 1916.¹

CUSTOMS DISTRICT AND CLASS OF VESSEL.	ENTERED.							CLEARED.						
	Total.		American ves-		Foreign vessels.		Per cent ton- nage of Amer- ican ves- sels forms of total.	Total.		American ves-		Foreign vessels.		Per cent ton- nage of Amer- ican ves- sels forms of total.
	Num- ber.	Tonnage.	Num- ber.	Tonnage.	Num- ber.	Tonnage.		Num- ber.	Tonnage.	Num- ber.	Tonnage.	Num- ber.	Tonnage.	
Atlantic and Gulf coasts districts.....	Sailing.. 2,801 Steam... 14,251	1,554,971 30,404,288	1,259 3,689	667,752 6,589,340	1,542 10,562	887,219 23,814,948	42.9 21.7	3,068 14,825	1,692,497 31,468,606	1,480 3,749	795,663 6,760,575	1,588 11,076	896,834 24,708,031	47.0 21.5
Atlantic coast districts.....	Sailing.. 1,830 Steam... 10,659	966,810 24,217,726	766 2,258	402,037 4,519,090	1,064 8,401	564,773 19,698,636	41.6 18.7	2,143 11,115	1,170,592 24,872,432	1,019 2,372	568,254 4,742,966	1,124 8,743	602,338 20,129,466	48.5 19.1
Connecticut.....	Sailing.. 87 Steam... 12	27,438 6,206	58 5	20,279 1,946	29 7	7,159 4,260	73.9 31.4	2 1	538 775	1 5	437 4,215	1 57	101 39,144	81.2 9.7
Georgia.....	Sailing.. 72 Steam... 139	53,258 262,954	10 11	7,812 23,749	62 128	45,446 239,205	14.7 9.0	62 142	43,359 269,925	5 15	4,215 32,853	57 127	39,144 237,072	9.7 12.2
Maine and New Hampshire.....	Sailing.. 190 Steam... 1,334	37,214 831,475	103 657	13,386 273,482	87 677	23,828 557,993	36.0 32.9	256 1,603	57,257 992,585	183 724	39,056 329,240	73 879	18,201 663,345	68.2 33.2
Maryland.....	Sailing.. 59 Steam... 1,082	83,625 2,444,537	24 92	40,168 266,170	35 990	43,457 2,178,367	48.0 10.9	55 1,092	58,985 2,358,532	29 84	27,985 227,162	26 1,008	31,000 2,131,370	47.4 9.6
Massachusetts.....	Sailing.. 415 Steam... 1,079	62,680 2,357,967	146 240	29,294 410,190	269 839	33,386 1,947,777	46.7 17.4	401 736	61,400 1,528,061	129 175	31,572 290,513	272 561	29,888 1,237,548	51.4 19.0
New York.....	Sailing.. 599 Steam... 4,589	505,231 12,956,122	267 986	216,624 2,859,864	332 3,603	288,607 10,096,258	42.9 22.1	794 4,598	577,677 13,341,280	355 1,009	228,799 2,996,625	439 3,589	348,878 10,344,635	39.6 22.5
North Carolina.....	Sailing.. 3 Steam... 27	2,168 51,182	3 3	2,168 7,755	..... 24	..... 43,427	100.0 15.2	1 17	1,402 34,039	1 2	1,402 5,081	..... 15	..... 28,958	100.0 14.9
Philadelphia.....	Sailing.. 132 Steam... 1,071	135,187 2,272,889	81 130	49,504 343,054	71 941	85,683 1,929,835	36.6 15.1	148 1,024	131,985 2,099,829	85 111	5,081 275,327	63 913	76,615 1,824,502	42.0 13.1
Porto Rico.....	Sailing.. 195 Steam... 387	15,975 488,217	44 71	5,004 95,765	151 316	10,971 392,452	31.3 19.6	218 390	34,015 488,935	70 81	23,831 109,872	148 309	10,684 379,063	68.6 22.5
Rhode Island.....	Sailing.. 21 Steam... 20	8,022 47,457	14 11	6,576 23,970	7 9	1,446 23,487	82.0 50.2	4 20	465 54,598	2 13	218 34,473	2 7	247 20,125	46.9 63.1
South Carolina.....	Sailing.. 16 Steam... 50	9,120 95,742	12 6	7,157 8,617	4 44	1,963 87,125	78.5 9.0	11 37	8,901 54,805	7 16	6,938 17,995	4 21	1,963 36,810	77.9 32.8
Virginia.....	Sailing.. 21 Steam... 869	26,892 2,402,978	4 46	4,065 204,528	17 823	22,827 2,198,450	15.1 8.5	191 1,455	194,548 3,649,068	152 142	148,931 423,825	39 1,313	45,617 3,225,243	76.6 11.6
Gulf coast districts.....	Sailing.. 971 Steam... 3,592	588,161 6,186,562	493 1,431	265,715 2,070,250	478 2,161	322,446 4,116,312	45.2 33.5	925 3,710	521,905 6,596,174	461 1,377	227,409 2,017,609	464 2,333	294,496 4,578,565	43.6 30.6
Florida.....	Sailing.. 450 Steam... 963	205,908 1,011,548	209 794	92,347 734,427	241 169	113,561 277,121	44.8 72.6	409 926	166,970 987,202	163 755	52,148 711,433	246 171	114,822 275,769	31.2 72.1
Galveston.....	Sailing.. 19 Steam... 509	10,387 1,127,045	13 77	7,068 184,371	6 432	3,319 942,474	68.0 16.4	17 598	9,509 1,314,564	10 87	5,802 184,334	7 511	3,707 1,130,230	61.0 14.0
Mobile.....	Sailing.. 340 Steam... 319	202,616 372,965	178 31	75,045 44,638	162 288	127,571 328,327	37.0 12.0	334 351	185,932 399,163	187 37	76,177 40,139	147 314	109,755 359,024	41.0 10.1
New Orleans.....	Sailing.. 51 Steam... 1,456	49,330 2,754,708	17 436	15,375 964,788	34 1,020	33,955 1,789,920	31.2 35.0	54 1,410	53,623 2,777,491	18 402	16,771 936,368	36 1,008	36,852 1,841,123	31.3 33.7
Sabine.....	Sailing.. 111 Steam... 345	119,920 920,296	76 93	75,880 141,826	35 252	44,040 778,470	63.3 15.4	111 425	105,871 1,117,754	83 96	76,511 145,335	28 329	29,360 972,419	72.3 13.0

¹ Bureau of Foreign and Domestic Commerce, Department of Commerce, "Commerce and Navigation of the United States," 1916.

Table 35 shows, in detail, for all vessels, the principal statistics of transportation on the Atlantic coast and Gulf of Mexico, by class, occupation, and character of ownership, for 1916.

TABLE 35.—ALL VESSELS, BY CLASS,

	CLASS, OCCUPATION, AND OWNERSHIP.	Number of vessels.	TONNAGE.		RIGGED.			HORSEPOWER OF ENGINES.	
			Gross.	Net.	Screw.	Side wheel.	Stern wheel.	Steam.	Gasoline.
1	Aggregate.....	25,387	6,614,197	5,457,627	9,922	257	179	2,447,754	242,989
2	STEAM AND MOTOR.....	10,358	2,890,009	1,893,193	9,922	257	179	2,447,754	242,989
3	Freight and passenger.....	2,798	2,403,734	1,574,068	2,584	131	83	1,669,276	49,900
4	Tugs and other towing vessels.....	1,856	153,122	93,373	1,781	4	71	420,729	14,736
5	Ferryboats.....	262	153,818	104,862	144	117	1	154,158	1,442
6	Fishing.....	2,011	61,056	39,156	1,988	.....	23	49,696	43,620
7	Yachts.....	2,587	31,766	56,777	2,587	.....	.....	111,025	105,756
8	Miscellaneous.....	844	36,513	24,957	838	5	1	42,370	27,485
9	Individual.....	5,940	170,933	119,401	5,846	18	76	191,333	168,746
10	Freight and passenger.....	1,210	43,537	31,713	1,161	12	37	22,114	25,512
11	Tugs and other towing vessels.....	496	22,183	13,564	461	1	34	52,462	6,479
12	Ferryboats.....	30	3,224	2,190	24	5	1	4,673	348
13	Fishing.....	1,271	18,501	13,371	1,267	.....	4	2,523	25,110
14	Yachts.....	2,392	76,011	52,702	2,392	.....	.....	106,031	98,733
15	Miscellaneous.....	541	7,477	5,861	541	.....	.....	3,530	12,564
16	Firm.....	930	31,520	21,344	898	3	29	40,229	20,328
17	Freight and passenger.....	262	10,288	7,277	246	1	15	7,980	5,828
18	Tugs and other towing vessels.....	186	10,259	6,240	173	1	12	28,402	1,702
19	Ferryboats.....	5	125	84	4	1	.....	100	87
20	Fishing.....	288	7,271	5,067	286	.....	2	1,555	7,525
21	Yachts.....	118	2,069	1,556	118	.....	.....	1,030	3,166
22	Miscellaneous.....	71	1,508	1,120	71	.....	.....	1,162	2,020
23	Incorporated company.....	3,295	2,649,285	1,727,687	2,998	223	74	2,156,000	43,991
24	Freight and passenger.....	1,314	2,347,147	1,533,467	1,166	117	31	1,636,611	18,415
25	Tugs and other towing vessels.....	1,156	119,371	72,754	1,129	2	25	335,535	6,605
26	Ferryboats.....	199	129,456	88,724	96	103	.....	119,465	977
27	Fishing.....	449	35,249	20,689	432	.....	17	45,618	10,936
28	Yachts.....	64	3,508	2,362	64	.....	.....	3,940	3,600
29	Miscellaneous.....	113	14,524	9,691	111	1	1	14,831	3,458
30	All other.....	193	38,271	24,761	180	13	.....	60,192	9,924
31	Freight and passenger.....	12	2,762	1,611	11	1	.....	2,571	145
32	Tugs and other towing vessels.....	18	1,309	815	18	.....	.....	4,330	.....
33	Ferryboats.....	28	20,983	13,864	20	8	.....	29,920	30
34	Fishing.....	3	35	29	3	.....	.....	.....	49
35	Yachts.....	13	178	157	13	.....	.....	24	257
36	Miscellaneous.....	119	13,004	8,285	115	4	.....	23,347	9,443
37	STEAM.....	3,396	2,734,189	1,776,494	3,055	256	85	2,447,754	.....
38	Freight and passenger.....	1,218	2,343,852	1,529,591	1,045	130	43	1,669,276	.....
39	Tugs and other towing vessels.....	1,454	147,631	89,530	1,410	4	40	420,729	.....
40	Ferryboats.....	225	152,951	104,237	107	117	1	154,158	.....
41	Fishing.....	206	28,728	16,780	206	.....	.....	49,696	.....
42	Yachts.....	173	36,023	21,038	173	.....	.....	111,025	.....
43	Miscellaneous.....	120	24,004	15,318	114	5	1	42,370	.....
44	Individual.....	629	82,433	51,490	582	17	30	191,333	.....
45	Freight and passenger.....	121	23,615	16,666	97	11	13	22,114	.....
46	Tugs and other towing vessels.....	290	19,614	11,696	273	1	16	52,462	.....
47	Ferryboats.....	18	3,071	2,060	12	5	1	4,673	.....
48	Fishing.....	27	1,557	924	27	.....	.....	2,523	.....
49	Yachts.....	154	33,223	19,277	154	.....	.....	106,031	.....
50	Miscellaneous.....	19	1,353	867	19	.....	.....	3,530	.....
51	Firm.....	226	18,797	12,067	204	3	19	40,229	.....
52	Freight and passenger.....	58	6,271	4,346	47	1	10	7,980	.....
53	Tugs and other towing vessels.....	141	9,734	5,864	131	1	9	28,402	.....
54	Ferryboats.....	1	77	41	.....	1	.....	100	.....
55	Fishing.....	11	1,549	1,077	11	.....	.....	1,555	.....
56	Yachts.....	4	519	346	4	.....	.....	1,030	.....
57	Miscellaneous.....	11	647	393	11	.....	.....	1,162	.....
58	Incorporated company.....	2,437	2,598,480	1,690,757	2,178	223	36	2,156,000	.....
59	Freight and passenger.....	1,032	2,311,320	1,507,046	895	117	20	1,636,611	.....
60	Tugs and other towing vessels.....	1,035	116,974	71,155	988	2	15	335,535	.....
61	Ferryboats.....	179	128,865	88,312	76	103	.....	119,465	.....
62	Fishing.....	168	26,622	14,779	168	.....	.....	45,618	.....
63	Yachts.....	14	2,238	1,375	14	.....	.....	3,940	.....
64	Miscellaneous.....	39	12,461	8,090	37	1	1	14,831	.....
65	All other.....	104	34,479	22,180	91	13	.....	60,192	.....
66	Freight and passenger.....	7	2,646	1,533	6	1	.....	2,571	.....
67	Tugs and other towing vessels.....	18	1,309	815	18	.....	.....	4,330	.....
68	Ferryboats.....	27	20,938	13,824	19	8	.....	29,920	.....
69	Fishing.....	.....	.....	.....	.....	.....	.....	.....	.....
70	Yachts.....	1	43	40	1	.....	.....	24	.....
71	Miscellaneous.....	51	9,543	5,968	47	4	.....	23,347	.....

OCCUPATION, AND OWNERSHIP: 1916.

CONSTRUCTION.			Value of vessels.	INCOME.				EMPLOYED ON VESSELS.		Number of passengers carried.	FREIGHT CARRIED (TONS OF 2,000 POUNDS).		
Metal	Wood.	Com- posite		Total.	Freight.	Passenger.	All other.	Number.	Wages.		Exclusive of lighterage.	Lighterage or harbor work.	
1,791	23,567	39	\$642,114,328	\$395,211,148	\$288,287,689	\$31,475,454	\$75,448,005	104,224	\$67,378,700	237,345,627	80,335,771	101,267,073	1
1,436	8,893	29	527,057,790	298,274,571	212,246,077	31,448,801	54,579,693	69,965	48,234,277	237,205,220	41,898,368	2,988,056	2
727	2,059	12	430,299,612	245,750,533	212,145,406	24,776,744	8,828,383	38,355	26,084,263	19,158,111	41,868,458	2,986,496	3
388	1,467	1	37,841,756	25,573,930	44,953	234	28,528,743	11,831	10,096,502	1,982	1,188		4
127	135		14,664,863	10,318,550		6,671,823	3,646,736	2,549	2,437,826	218,045,127			5
19	1,992		9,647,473	12,403,487	53,210		12,350,277	10,166	5,208,201		28,338		6
121	2,452	14	25,590,224	146,078			146,078	4,806	2,643,167				7
54	788	2	9,013,862	3,081,984	2,508		3,079,476	2,258	1,767,318		354	1,560	8
178	5,748	14	37,648,812	12,081,183	2,383,587	674,492	9,023,104	14,019	7,173,139	4,466,804	1,275,435	217,474	9
13	1,166	1	4,211,921	2,920,388	2,308,154	480,855	131,379	2,753	1,032,516	1,812,537	1,259,093	215,914	10
40	456		5,632,239	4,085,220	44,453	234	4,040,533	2,110	1,609,538	1,982			11
6	24		4,404,800	242,861		193,403	49,458	1,103	66,017	2,652,285			12
3	1,265		2,159,786	4,072,493	28,472		4,044,021	3,953	1,813,025		15,225		13
114	2,266	12	24,142,366	128,773			128,773	4,484	2,466,841				14
2	538	1	1,097,700	631,448	2,508		628,940	616	185,202		354	1,560	15
25	905		4,682,536	4,632,049	687,011	129,493	3,815,545	3,297	2,147,996	358,396	386,276	78,675	16
6	256		1,067,529	846,781	681,600	122,023	43,158	738	355,509	286,786	382,401	78,675	17
14	172		1,987,817	1,853,973			1,853,973	945	756,774				18
	5		13,500	10,745		7,470	3,275	7	4,268	71,610			19
1	287		841,920	1,708,491	5,411		1,703,080	1,374	889,555		3,875		20
3	115		558,950	13,705			13,705	115	70,683				21
1	70		212,820	198,354			198,354	118	71,207				22
1,180	2,100	15	477,717,020	279,968,636	209,109,342	29,886,931	40,972,363	51,034	37,203,879	208,448,844	40,211,350	2,691,907	23
708	595	11	424,682,277	241,916,425	209,089,515	24,173,064	8,653,846	34,789	24,622,697	17,057,818	40,201,687	2,691,907	24
328	827	1	29,915,780	20,452,813	500		20,452,313	8,689	7,645,955		425		25
110	89		11,896,378	8,837,330		5,713,867	3,123,463	1,977	1,842,768	191,391,026			26
15	434		6,642,267	6,615,383	19,327		6,596,056	4,831	2,497,501		9,238		27
4	58	2	867,758	3,600			3,600	195	101,353				28
15	97	1	3,712,580	2,143,085			2,143,085	553	493,605				29
63	140		7,009,422	1,592,703	66,137	757,885	768,681	1,615	1,709,263	23,931,176	25,307		30
	12		337,885	66,939	66,137	802		75	73,541	970	25,307		31
6	12		305,920	181,924			181,924	87	84,235				32
11	17		2,350,185	1,227,623		757,083	470,540	462	524,773	23,930,206			33
	3		3,500	7,120			7,120	8	5,120				34
	13		21,150					12	4,290				35
36	83		3,990,782	109,097			109,097	971	1,017,304				36
1,357	2,017	22	498,229,447	285,024,224	209,410,213	30,975,127	44,638,884	55,451	40,974,721	234,491,468	40,382,827	2,916,978	37
698	509	11	421,832,464	242,465,651	209,358,250	24,405,921	8,701,480	35,329	24,333,289	17,727,306	40,374,179	2,916,978	38
384	1,069		36,861,706	25,558,382	43,543		25,514,839	10,995	9,653,231		360		39
127	98		14,555,401	10,198,522		6,569,206	3,629,316	2,469	2,400,109	216,764,162			40
15	191		5,761,664	4,499,385	8,420		4,490,963	3,270	1,654,605		8,288		41
91	73	9	12,826,874	44,053			44,053	2,285	1,342,026				42
42	77	1	6,391,358	2,258,233			2,258,233	1,103	991,481				43
143	478	7	20,183,664	5,478,134	980,844	400,407	4,096,883	5,123	3,326,863	3,097,480	413,885	195,426	44
12	109		2,197,500	1,242,297	937,301	243,333	61,663	901	450,838	841,857	413,625	195,426	45
39	251		5,219,489	3,652,273	43,543		3,608,730	1,755	1,449,009		360		46
6	12		379,950	202,161			45,087	82	63,181	2,255,623			47
	27		190,700	245,428			245,428	208	119,306				48
80	61	7	12,030,825	37,228			37,228	2,097	1,219,379				49
	19		165,200	98,747			98,747	80	35,148				50
21	205		2,927,959	2,419,777	341,343	91,523	1,986,911	1,367	1,040,830	244,653	178,504	73,939	51
4	54		643,117	452,604	340,967	90,323	21,314	335	194,649	232,653	177,828	73,939	52
13	128		1,875,842	1,770,069			1,770,069	854	715,546				53
	1		7,000	2,850		1,200	1,650	4	2,848	12,000			54
1	10		101,000	79,646	376		79,270	77	44,156		676		55
2	2		222,500	6,825			6,825	47	45,433				56
1	10		78,500	107,783			107,783	50	38,198				57
1,149	1,273	15	469,258,072	275,594,226	208,029,945	29,726,114	37,838,167	47,770	35,396,801	207,237,129	39,770,319	2,647,613	58
682	339	11	418,663,262	240,712,669	208,021,901	24,072,265	8,618,503	34,026	24,217,995	16,652,796	39,762,707	2,647,613	59
328	678	1	29,460,455	19,954,116			19,954,116	8,299	7,404,441				60
110	69		11,823,266	8,765,888		5,653,849	3,112,039	1,923	1,821,405	190,584,333			61
14	154		5,469,964	4,174,309	8,044		4,166,265	2,985	1,491,143		7,612		62
3	9	2	568,549					134	75,084				63
14	24	1	3,272,576	1,987,244			1,987,244	403	386,733				64
44	60		5,859,752	1,532,087	58,081	757,083	716,923	1,191	1,210,227	23,912,206	20,119		65
	7		328,585	58,081	58,081			67	69,787		20,119		66
6	12		305,920	181,924			181,924	87	84,235				67
11	16		2,345,185	1,227,623		757,083	470,540	460	522,673	23,912,206			68
													69
			5,000					7	2,130				70
27	24		2,875,062	64,459			64,459	570	531,402				71

TABLE 35.—ALL VESSELS, BY CLASS, OCCU-

	CLASS, OCCUPATION, AND OWNERSHIP.	Number of vessels.	TONNAGE.		RIGGED.			HORSEPOWER OF ENGINES.	
			Gross.	Net.	Screw.	Side wheel.	Stern wheel.	Steam.	Gasoline.
1	MOTOR.....	6,962	155,820	116,699	6,867	1	94		242,989
2	Freight and passenger.....	1,580	59,882	44,477	1,539	1	40		49,900
3	Tugs and other towing vessels.....	402	5,491	3,843	371		31		14,786
4	Ferryboats.....	37	867	625	37				1,442
5	Fishing.....	1,805	31,328	22,376	1,782		23		43,620
6	Yachts.....	2,414	45,743	35,739	2,414				105,756
7	Miscellaneous.....	724	12,509	9,639	724				27,485
8	Individual.....	5,311	88,500	67,911	5,264	1	46		168,746
9	Freight and passenger.....	1,089	19,922	15,047	1,064	1	24		25,512
10	Tugs and other towing vessels.....	206	2,569	1,868	188		18		6,479
11	Ferryboats.....	12	153	130	12				348
12	Fishing.....	1,244	16,944	12,447	1,240		4		25,110
13	Yachts.....	2,238	42,788	33,425	2,238				98,733
14	Miscellaneous.....	522	6,124	4,994	522				12,564
15	Firm.....	704	12,723	9,277	694		10		20,328
16	Freight and passenger.....	204	4,017	2,931	199		5		5,828
17	Tugs and other towing vessels.....	45	525	376	42		3		1,702
18	Ferryboats.....	4	48	43	4				87
19	Fishing.....	277	5,722	3,990	275		2		7,525
20	Yachts.....	114	1,550	1,210	114				3,166
21	Miscellaneous.....	60	861	727	60				2,020
22	Incorporated company.....	858	50,805	36,930	820		38		43,991
23	Freight and passenger.....	282	35,827	26,421	271		11		18,415
24	Tugs and other towing vessels.....	151	2,397	1,599	141		10		6,605
25	Ferryboats.....	20	621	412	20				977
26	Fishing.....	281	8,627	5,910	264		17		10,936
27	Yachts.....	50	1,270	987	50				3,600
28	Miscellaneous.....	74	2,063	1,601	74				3,458
29	All other.....	89	3,792	2,581	89				9,924
30	Freight and passenger.....	5	116	78	5				145
31	Tugs and other towing vessels.....								
32	Ferryboats.....	1	45	40	1				30
33	Fishing.....	3	35	29	3				49
34	Yachts.....	12	135	117	12				257
35	Miscellaneous.....	68	3,461	2,317	68				9,443
36	SAIL.....	4,257	847,950	748,794					
37	Freight and passenger.....	1,972	790,630	704,160					
38	Fishing.....	1,718	44,524	33,677					
39	Yachts.....	495	10,180	8,598					
40	Miscellaneous.....	72	2,616	2,359					
41	Individual.....	2,796	203,549	177,491					
42	Freight and passenger.....	1,006	169,980	150,517					
43	Fishing.....	1,281	23,257	18,259					
44	Yachts.....	458	9,585	8,073					
45	Miscellaneous.....	51	727	642					
46	Firm.....	600	138,770	118,310					
47	Freight and passenger.....	358	131,925	113,037					
48	Fishing.....	207	6,389	4,868					
49	Yachts.....	31	355	310					
50	Miscellaneous.....	4	101	95					
51	Incorporated company.....	804	489,996	439,925					
52	Freight and passenger.....	569	474,773	428,910					
53	Fishing.....	220	13,676	9,627					
54	Yachts.....	5	218	198					
55	Miscellaneous.....	10	1,329	1,190					
56	All other.....	57	15,635	13,068					
57	Freight and passenger.....	39	13,952	11,696					
58	Fishing.....	10	1,202	923					
59	Yachts.....	1	22	17					
60	Miscellaneous.....	7	459	432					
61	UNRIGGED.....	10,772	2,876,238	2,815,640					
62	Canal boats.....	445	63,730	61,090					
63	Other unriggerd.....	10,327	2,812,508	2,754,550					
64	Individual.....	2,123	455,063	449,110					
65	Canal boats.....	268	36,765	35,142					
66	Other unriggerd.....	1,855	418,298	413,968					
67	Firm.....	1,103	284,636	280,101					
68	Canal boats.....	17	2,638	2,596					
69	Other unriggerd.....	1,086	281,998	277,505					
70	Incorporated company.....	7,416	2,110,441	2,060,662					
71	Canal boats.....	160	24,327	23,352					
72	Other unriggerd.....	7,256	2,086,114	2,037,310					
73	All other.....	130	26,098	25,767					
74	Canal boats.....								
75	Other unriggerd.....	130	26,098	25,767					

PATION, AND OWNERSHIP: 1916—Continued.

CONSTRUCTION.			Value of vessels.	INCOME.				EMPLOYED ON VESSELS.		Number of passengers carried.	FREIGHT CARRIED (TONS OF 2,000 POUNDS).		
Metal.	Wood.	Com- posite.		Total.	Freight.	Passenger.	All other.	Number.	Wages.		Exclusive of lighterage.	Lighterage or harbor work.	
79	6,876	7	\$28,828,343	\$13,250,347	\$2,835,864	\$473,674	\$9,940,809	14,514	\$7,259,556	2,713,752	1,515,541	71,078	1
29	1,550	1	8,467,148	3,284,882	2,787,156	370,823	126,903	3,026	1,150,994	1,430,805	1,494,309	69,518	2
4	398	.....	980,050	1,015,548	1,410	234	1,013,904	836	443,271	1,982	828	.....	3
.....	37	.....	109,462	120,037	.....	102,617	17,420	80	37,717	1,280,965	.....	.....	4
4	1,801	.....	3,885,809	7,904,104	44,790	.....	7,859,314	6,896	3,550,596	.....	20,050	.....	5
30	2,379	5	12,763,350	102,025	.....	.....	102,025	2,521	1,301,141	.....	.....	.....	6
12	711	1	2,622,524	823,751	2,508	.....	821,243	1,155	775,837	.....	354	1,560	7
35	5,269	7	17,465,148	6,603,049	1,402,743	274,085	4,926,221	8,896	3,846,276	1,369,324	861,550	22,048	8
1	1,087	1	2,014,421	1,678,091	1,370,853	237,522	69,716	1,852	581,678	970,680	845,568	20,488	9
1	206	.....	412,750	432,947	910	234	431,803	355	160,529	1,982	403	.....	10
.....	12	.....	24,850	40,700	.....	36,329	4,371	21	12,834	396,662	.....	.....	11
3	1,241	.....	1,969,086	3,827,065	28,472	.....	3,798,593	3,745	1,693,719	.....	15,225	.....	12
28	2,205	5	12,111,541	91,545	.....	.....	91,545	2,387	1,247,462	.....	.....	.....	13
2	519	1	932,500	532,701	2,508	.....	530,193	536	150,054	.....	354	1,560	14
4	700	.....	1,754,577	2,212,272	345,668	37,970	1,828,634	1,930	1,107,166	113,743	207,772	4,736	15
2	202	.....	424,412	394,177	340,633	31,700	21,844	403	160,860	54,133	204,573	4,736	16
1	4	.....	111,975	83,904	.....	.....	83,904	91	41,228	.....	.....	.....	17
.....	.....	.....	6,500	7,895	.....	6,270	1,625	3	1,420	59,610	.....	.....	18
.....	277	.....	740,920	1,628,845	5,035	.....	1,623,810	1,297	845,399	.....	3,199	.....	19
1	113	.....	336,450	6,880	.....	.....	6,880	68	25,250	.....	.....	.....	20
.....	60	.....	134,320	90,571	.....	.....	90,571	68	33,009	.....	.....	.....	21
31	827	.....	8,458,948	4,374,410	1,079,397	160,817	3,134,196	3,264	1,807,078	1,211,715	441,031	44,294	22
26	256	.....	6,019,015	1,203,756	1,067,614	100,799	35,343	763	404,702	405,022	438,980	44,294	23
2	149	.....	455,325	498,697	500	.....	498,197	390	241,514	.....	425	.....	24
.....	20	.....	73,112	71,442	.....	60,015	11,424	54	21,363	806,693	.....	.....	25
1	280	.....	1,172,303	2,441,074	11,293	.....	2,429,791	1,846	1,006,353	.....	1,626	.....	26
1	49	.....	299,209	3,600	.....	.....	3,600	61	26,269	.....	.....	.....	27
1	73	.....	439,984	155,841	.....	.....	155,841	150	106,872	.....	.....	.....	28
9	80	.....	1,149,670	60,616	8,056	802	51,753	424	499,036	18,970	5,188	.....	29
.....	6	.....	9,300	8,858	8,056	802	.....	8	3,754	.....	5,188	.....	30
.....	1	.....	5,000	.....	.....	.....	.....	2	2,100	18,000	.....	.....	31
.....	3	.....	3,500	7,120	.....	.....	7,120	8	5,120	.....	.....	.....	32
.....	12	.....	16,150	.....	.....	.....	.....	5	2,160	.....	.....	.....	33
9	59	.....	1,115,720	44,638	.....	.....	44,638	401	485,902	.....	.....	.....	34
98	4,150	9	46,323,549	35,820,509	29,493,152	17,726	6,309,631	18,672	8,513,037	867	13,348,876	61,640	36
85	1,887	.....	40,824,576	29,758,507	29,417,669	17,726	323,112	8,706	4,861,444	867	13,300,818	61,640	37
3	1,715	.....	3,392,652	6,001,601	75,433	.....	5,926,118	9,080	3,270,535	.....	48,053	.....	38
10	478	9	1,792,288	1,650	.....	.....	1,650	772	345,041	.....	.....	.....	39
.....	72	.....	314,033	53,751	.....	.....	53,751	114	36,067	.....	.....	.....	40
21	2,767	8	11,410,462	9,681,400	6,582,900	3,800	3,094,700	9,523	3,441,453	537	2,390,850	52,662	41
8	998	.....	6,098,513	6,583,363	6,536,987	3,800	42,576	3,293	1,471,791	537	2,360,869	52,662	42
3	1,278	.....	1,519,358	3,067,983	45,913	.....	3,022,070	5,428	1,619,427	.....	29,981	.....	43
10	440	8	1,732,808	1,650	.....	.....	1,650	756	339,978	.....	.....	.....	44
.....	51	.....	59,783	23,404	.....	.....	23,404	46	10,257	.....	.....	.....	45
3	596	1	6,151,622	6,902,194	5,851,596	13,900	1,036,698	2,974	1,678,019	320	1,248,304	2,500	46
3	355	.....	5,610,958	5,844,675	5,829,224	13,900	1,551	1,761	1,119,978	320	1,231,260	2,500	47
.....	207	.....	494,684	1,055,769	22,372	.....	1,033,397	1,192	552,078	.....	17,044	.....	48
.....	30	1	38,880	.....	.....	.....	.....	15	4,963	.....	.....	.....	49
.....	4	.....	7,100	1,750	.....	.....	1,750	6	1,000	.....	.....	.....	50
74	730	.....	27,903,479	18,485,597	16,499,849	26	1,985,722	5,731	3,105,257	10	9,537,903	6,478	51
74	495	.....	26,421,219	16,772,400	16,493,389	26	273,985	3,439	2,123,336	10	9,537,517	6,478	52
.....	220	.....	1,273,010	1,639,600	6,460	.....	1,633,140	2,263	970,914	.....	386	.....	53
.....	5	.....	19,600	.....	.....	.....	.....	.....	.....	.....	.....	.....	54
.....	10	.....	189,650	23,597	.....	.....	23,597	29	11,007	.....	.....	.....	55
.....	57	.....	857,986	751,318	558,807	.....	.....	444	288,258	.....	171,819	.....	56
.....	39	.....	693,886	558,069	558,069	.....	.....	213	146,339	.....	171,172	.....	57
.....	10	.....	105,600	188,249	738	.....	.....	197	128,118	.....	647	.....	58
.....	1	.....	1,000	.....	.....	.....	.....	1	100	.....	.....	.....	59
.....	7	.....	57,500	5,000	.....	.....	5,000	33	13,803	.....	.....	.....	60
257	10,514	1	68,732,989	61,116,068	46,548,460	8,927	14,558,681	15,587	10,631,336	139,540	25,088,527	98,217,377	61
4	441	.....	914,437	617,159	566,732	.....	50,427	360	206,519	.....	357,845	2,212,352	62
253	10,073	1	67,818,552	60,493,909	45,981,728	8,927	14,508,254	15,227	10,424,817	139,540	24,730,682	96,005,025	63
12	2,111	.....	7,375,557	5,863,176	4,993,422	.....	869,754	2,206	1,221,490	.....	3,389,607	7,529,980	64
4	264	.....	565,951	250,459	241,601	.....	8,858	194	109,897	.....	101,421	1,177,684	65
1	1,847	.....	6,809,606	5,612,717	4,751,821	.....	860,896	2,012	1,111,593	.....	3,288,186	6,352,296	66
9	1,094	.....	5,690,442	4,675,867	3,370,585	.....	1,305,282	1,541	918,606	.....	3,061,736	6,213,823	67
.....	17	.....	52,600	11,466	10,766	.....	700	15	8,850	.....	12,100	28,850	68
9	1,077	.....	5,637,842	4,664,401	3,359,819	.....	1,304,582	1,526	909,756	.....	3,049,636	6,184,973	69
236	7,179	1	54,883,095	50,275,297	38,180,603	8,927	12,085,767	11,771	8,447,273	139,540	18,633,384	84,467,574	70
.....	160	.....	295,886	355,234	314,365	.....	40,869	151	87,772	.....	244,324	1,005,818	71
236	7,019	1	54,587,209	49,920,063	37,866,238	8,927	12,044,898	11,620	8,359,506	139,540	18,389,060	83,461,756	72
.....	130	.....	783,895	301,728	3,850	.....	297,878	69	43,962	.....	3,800	6,000	73
.....	130	.....	783,895	301,728	3,850	.....	297,878	69	43,962	.....	3,800	6,000	74
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75

PACIFIC COAST

PACIFIC COAST (INCLUDING ALASKA).

BY F. W. CHASE.

SCOPE OF THE REPORT.

The statistics of water transportation which are presented in this section of the report are for vessels operating on the coasts of the three states bordering on the Pacific Ocean and the territory of Alaska. The report for the census of 1889 did not include Alaska. In that year very little shipping was carried on entirely within Alaskan waters, and the majority of the vessels operating between Alaska and ports in Washington, Oregon, or California were credited to those states. Under these conditions, the totals for the shipping on the Pacific coast, including Alaska, for 1916 and 1906 are properly placed in comparison with the totals for the Pacific coast in 1889.

The total shore line of the three states, including the shore line on tidal waters to points where such waters narrow to a width of 1 statute mile, is estimated to be about 3,700 statute miles. There has been, however, no systematic survey of water areas adjacent to these states for 20 years. This coast line, with its numerous harbors and rivers that penetrate far into the interior, affords exceptional facilities for the prosecution of maritime commerce. A considerable foreign trade is carried on between the Pacific coast ports and Great Britain, Japan, China, and South America, while regular passenger and freight vessels ply between the Hawaiian and Philippine Islands.

The harbors on the Pacific coast are exceptionally good, and while the true harbors are not numerous there are roadsteads and many ports that afford safe anchorage. San Francisco Bay, which is about 40 miles long, furnishes the principal harbor on the coast and is one of the finest in the world. Adjoining it on the north is San Pablo Bay which is connected with Suisun Bay by the Strait of Carquinez. The Sacramento and San Joaquin Rivers discharge together at the eastern end of Suisun Bay, affording continuous navigation from the sea to Sacramento and Stockton; and for light-draft boats these rivers are navigable north to Red Bluff on the Sacramento and to Firebaugh on the San Joaquin.

The next harbor of importance in California is at Los Angeles, on the river of the same name, about 14 miles from the Pacific Ocean. In the extreme southern part of California is the harbor of San Diego, about 500 miles from San Francisco Harbor.

While the lack of deep and convenient harbors on the California coast centralizes commerce at San Francisco, a large amount of commerce is carried on by

small vessels which find shelter and opportunity in the roadsteads which are distributed over almost the whole length of the coast, the principal ones being Los Angeles (San Pedro), San Luis Obispo, Monterey, and Santa Cruz, situated south of San Francisco, and Drakes Bay, Trinidad, and Crescent City to the north.

The coast line of Oregon is but little indented. The landings for commercial purposes are principally formed by the mouths of rivers, the mouths of the Rogue River, the Coquille, the Umpqua, and the Siuslaw being of the most importance. Good harbors are also found at Port Orford, Coos Bay, Tillamook Bay, and Yaquina Bay.

The most remarkable waterways of Oregon are the Columbia and Willamette Rivers. The Willamette flows northward and empties into the Columbia about 100 miles from the ocean, and is navigable for light craft as far as Eugene.

The city of Portland, situated on the Willamette River, about 12 miles from its confluence with the Columbia and 110 miles by river from the sea, is the head of ocean navigation for nearly the whole area drained by the Columbia River, and is the first place north of San Francisco, from which it is distant about 700 miles, which will admit seagoing vessels of all classes.

The only indentations of any commercial consequence on the coast of Washington between the mouth of the Columbia River and Cape Flattery are Willapa Harbor and Grays Harbor. The distinguishing feature of the coast of Washington is Puget Sound. This landlocked body of salt water, together with its many navigable inlets extending inland from 5 to 35 miles, gives the state a commanding position in the commercial development of the Pacific coast. Seattle, the commercial center of Puget Sound, is about 150 miles from the sea and its harbor admits the largest ocean-going vessels. Seattle is the starting point as well as the distributing point for practically all the Alaskan trade. Regular steamers leave this port for Ketchikan, Wrangell, Juneau, Nome, and other Alaskan points. Steamers also leave this port for British Columbia, Japan, China, Australia, South America, Hawaii, Philippine Islands, Great Britain, and other foreign countries.

Other cities of importance from a shipping standpoint situated on Puget Sound are Port Angeles, Bellingham, Anacortes, Everett, Tacoma, and Olympia, the latter city being at the head of navigation, 50 miles SSW. of Seattle.

GENERAL SUMMARY.

The comparative tables in this report do not include vessels engaged in the fisheries, as statistics

concerning such vessels were not secured in 1906 or 1889.

Table 1 summarizes the general statistics for 1916, 1906, and 1889.

TABLE 1.—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916, 1906, AND 1889.

	TOTAL.			STEAM. ¹			SAIL. ²			UNRIGGED.		
	1916	1906	1889 ³	1916	1906	1889	1916	1906	1889	1916	1906	1889
Number of vessels.....	4,092	2,537	1,635	2,123	1,066	465	296	666	681	1,673	805	489
Gross tonnage.....	1,185,961	977,687	419,157	710,360	518,107	160,293	222,040	305,283	195,508	253,561	154,297	63,356
Value of vessels.....	\$127,310,646	\$76,622,633	\$21,824,040	\$105,987,697	\$60,440,145	\$14,767,355	\$13,259,661	\$11,533,171	\$6,231,340	\$8,063,288	\$4,649,317	\$825,345
Gross income.....	\$80,215,193	\$48,520,139	\$19,872,738	\$72,149,333	\$40,220,388	\$12,959,914	\$8,065,860	\$8,299,751	\$6,912,824	(⁴)	(⁴)	(⁴)
Number employed on vessels.....	23,576	20,142	11,315	20,014	15,661	6,682	3,562	4,481	4,633	(⁴)	(⁴)	(⁴)
Wages.....	\$18,055,141	\$12,950,399	\$5,880,421	\$16,366,933	\$10,230,828	\$3,567,226	\$1,688,208	\$2,719,571	\$2,313,195	(⁴)	(⁴)	(⁴)
Number of passengers carried.....	55,408,843	44,189,971	15,672,093	55,408,843	44,187,184	15,672,093	.....	2,787	.....	.....	.....	.....
Freight and harbor work (tons of 2,000 pounds).....	25,125,484	17,622,816	11,249,927	23,377,203	14,173,599	8,488,101	1,748,281	3,449,217	2,761,826	(⁴)	(⁴)	(⁴)
Freight carried.....	21,853,985	13,301,293	8,818,363	20,105,704	(⁴)	(⁴)	1,748,281	(⁴)	(⁴)	(⁴)	(⁴)	(⁴)
Harbor work.....	3,271,499	4,321,523	2,431,564	3,271,499	(⁴)	(⁴)	.....	(⁴)	(⁴)	(⁴)	(⁴)	(⁴)

¹ Includes craft propelled by machinery.

² Includes schooner barges, scow schooners, etc., when fitted with sails.

³ Excludes 10 steamers and 86 sailing vessels registered in Atlantic coast ports, but engaged wholly or partially in business on the Pacific coast.

⁴ Included in statistics for steam vessels.

⁵ Figures not available.

Table 2 gives percentages of increase based on figures given in Table 1.

TABLE 2.—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS, PER CENT OF INCREASE: 1889-1916 AND 1906-1916.

	PER CENT OF INCREASE. ¹							
	Total.		Steam. ²		Sail.		Unrigged.	
	1906-1916	1889-1916	1906-1916	1889-1916	1906-1916	1889-1916	1906-1916	1889-1916
Number of vessels.....	61.3	150.3	99.2	356.6	-55.6	-56.5	107.8	242.1
Gross tonnage.....	21.3	182.9	37.1	343.2	-27.3	13.6	64.3	300.2
Value of vessels.....	66.2	483.4	75.4	617.7	15.0	112.8	73.4	877.0
Gross income.....	65.3	303.6	79.4	456.7	-2.8	16.7	(³)	(³)
Number employed on vessels.....	17.0	108.4	27.8	199.5	-20.5	-23.1	(³)	(³)
Wages.....	39.4	207.0	60.0	358.8	-37.9	-27.0	(³)	(³)
Number of passengers carried.....	25.4	253.6	25.4	253.6	.....	.....	.....	.....
Freight and harbor work (tons of 2,000 pounds).....	42.6	123.3	64.9	175.4	-49.3	-36.7	(³)	(³)
Freight carried.....	64.3	147.8	(³)	(³)	(³)	(³)	(³)	(³)
Harbor work.....	-24.3	34.5	(³)	(³)	(³)	(³)	(³)	(³)

¹ A minus sign (—) denotes decrease.

² Includes craft propelled by machinery.

³ Figures not available.

DIAGRAM 1.—GROSS TONNAGE OF ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916, 1906, AND 1889.

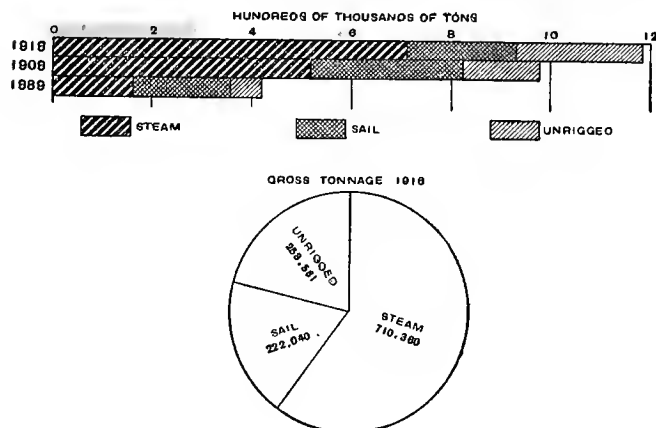


DIAGRAM 2.—VALUE OF ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916, 1906, AND 1889.

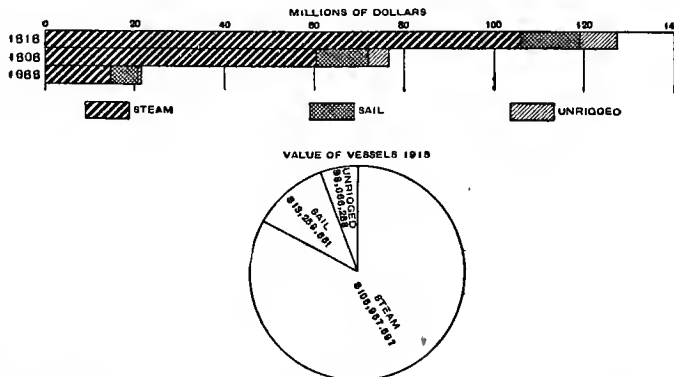
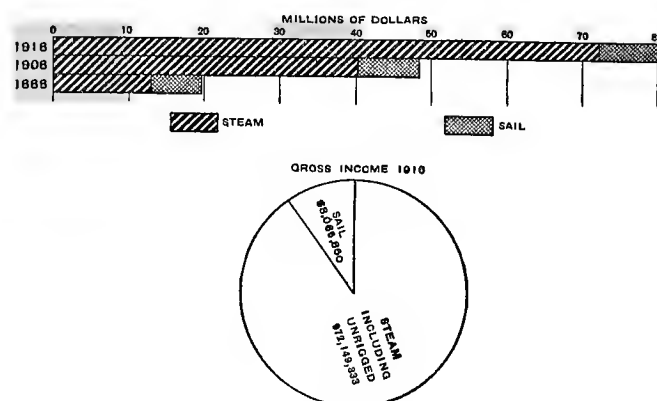


DIAGRAM 3.—GROSS INCOME OF ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916, 1906, AND 1889.



Taken as a whole, the statistics for the Pacific coast show a satisfactory increase for the decade 1906-1916. The totals for all classes of vessels combined show increases from census to census for each item presented in Table 1, except harbor work from 1906 to 1916. Increases are shown for steam vessels, which include all craft propelled by machinery, while sailing

vessels show a general decrease from 1906 to 1916 in all items, except value. The fact that all craft equipped with propelling power were classified as steam vessels, and the further fact that during the last decade many sailing vessels have been equipped with auxiliary power placing them in the "steam" class has had some effect in reducing the actual number of sailing vessels. In 1889 the sailing vessels on the Pacific coast represented 41.7 per cent of the total number, while in 1906 the percentage was 26.3, and in 1916 it was only 7.2. Correspondingly, their proportion of the total tonnage decreased from 46.6 to 31.2 and to 18.7 per cent, respectively, at the later censuses. Steam vessels show an increase over 1906 of 1,057 in number, their gross tonnage having increased 192,253 tons, and their value \$45,547,552, the percentages of increase being 99.2, 37.1, and 75.4, respectively.

The increase over 1906 of 66.2 per cent in the total value of all vessels is to a greater or less degree problematical, as the estimate placed upon the valuation of a vessel is often dependent upon extraneous conditions, and frequently overestimated by the owner, while, on the other hand, a "book value" may have been reported which is below the actual commercial value. Valuation, therefore, by itself, or as compared with tonnage, may to some extent be misleading.

The gross income increased from \$48,520,139 in 1906 to \$80,215,193 in 1916, or 65.3 per cent. Steam

vessels and unrigged craft combined contributed 89.9 per cent of the total income in 1916 and sailing vessels 10.1 per cent. In many cases no separate report of income was obtainable for barges and other unrigged craft which were towed by tugs of the same ownership. In such cases, the freight carried on unrigged craft was credited to these craft, while the income was reported for the towing vessels.

The total number of passengers carried shows an increase of 11,218,872, or 25.4 per cent, over 1906.

Important among the items shown in Tables 1 and 2 is that of freight movements. A marked development is shown in freight traffic on the Pacific coast during the passing of the 27 years covered by these tables. In 1889 an attempt was made to include "logs towed in rafts" as freight, but this was found to be so unsatisfactory that the attempt was abandoned at the census of 1906. It is uncertain how much of such freight was included in the 1889 figures, but it is safe to assume that it would form but a small percentage of the total.

The total amount of freight carried, including harbor work, increased 7,502,668 tons, or 42.6 per cent, between 1906 and 1916. The lighterage—or harbor work—included in the total freight carried amounted to 3,271,499 tons in 1916 and to 4,321,523 tons in 1906. The decrease in amount of freight carried by sailing vessels is due largely to the change of classification owing to the installation of auxiliary power.

TABLE 3.—ALL VESSELS AND CRAFT, BY OCCUPATION, WITH PER CENT OF TOTAL: 1916.

OCCUPATION.	VESSELS.		TONNAGE.		VALUE OF VESSELS.		GROSS INCOME.		EMPLOYED ON VESSELS.		WAGES.	
	Num-ber.	Per cent of total.	Gross tons.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.	Number.	Per cent of total.	Amount.	Per cent of total.
Total.....	4,962	100.0	1,215,303	100.0	\$132,524,924	100.0	\$85,030,184	100.0	28,466	100.0	\$20,483,963	100.0
Commercial vessels.....	4,530	91.3	1,201,933	98.9	129,325,880	97.6	84,719,391	99.6	27,950	98.2	20,055,835	97.9
Freight and passenger.....	1,269	25.6	831,950	68.5	102,573,994	77.4	65,330,908	76.8	18,309	64.3	13,411,782	65.5
Tugs and other towing vessels.....	642	12.9	35,600	2.9	6,866,384	5.2	6,019,784	7.1	2,412	8.5	2,116,600	10.3
Fishing vessels.....	870	17.5	29,342	2.4	5,214,278	3.9	4,814,991	5.7	4,890	17.2	2,428,822	11.9
Ferryboats.....	76	1.5	51,480	4.2	6,607,936	5.0	3,259,556	3.8	825	2.9	964,080	4.7
Municipal.....	11	0.2	4,209	0.3	401,637	0.3	89,628	0.1	106	0.4	112,212	0.5
Railroad.....	28	0.6	43,846	3.6	5,799,857	4.4	2,786,849	3.3	607	2.1	757,485	3.7
All other.....	37	0.7	3,425	0.3	406,442	0.3	383,079	0.4	112	0.4	94,383	0.5
Unrigged craft.....	1,673	33.7	253,561	20.9	8,063,288	6.1	15,294,162	18.0	11,514	40.5	11,134,551	54.4
Yachts.....	322	6.5	9,009	0.7	2,211,062	1.7	47,951	0.1	270	0.9	208,682	1.0
Miscellaneous.....	110	2.2	4,361	0.4	987,982	0.7	262,842	0.3	246	0.9	219,446	1.1

¹ In many cases the income, employees, and wages for unrigged craft were not reported separately, but were included in the reports for towing vessels.

Of the Pacific coast fleet the vessels used for commercial purposes formed 91.3 per cent of the total number, and their tonnage and value formed 98.9 and 97.6 per cent of the respective totals. A further segregation has been made which presents statistics for vessels according to their character of service. Those classed as freight and passenger were the most important in every respect, except as to number of vessels. Together with the unrigged they repre-

sented 59.3 per cent of the total number of vessels, 89.3 per cent of the gross tonnage, and 83.1 per cent of the gross income. Tugs and towing vessels are so closely related, and so essential to the freight and passenger and the unrigged craft, that it is unsatisfactory to consider separately several of the items connected with their statistics. They represented, however, 2.9 per cent of the total tonnage and 5.2 per cent of the total value.

In 1906 ferryboats owned and operated by railroad companies in transferring cars were classified as ferryboats. The statistics for 1916 eliminated such craft from that class and included them with the passenger and freight service. The 76 ferryboats in 1916 formed 1.5 per cent of the number of all classes, 4.2 per cent of the total tonnage, and reported 3.8 per cent of the total income.

Fishing vessels, engaged primarily in salmon fishing, reported 17.2 per cent of the total number of employees, and 11.9 per cent of the total amount of

wages, while they represented 17.5 per cent of the total number of craft reported.

The 322 yachts formed 6.5 per cent of the total number and 1.7 per cent of the total value of all vessels, but for none of the other items contained in the table did their proportion exceed 1 per cent.

The miscellaneous group of vessels embraced dredges, pilot boats, water boats, those used for scientific and benevolent purposes, and various other vessels not specifically covered by the other classifications.

TABLE 4.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CLASS AND OCCUPATION: 1916 AND 1906.

CLASS AND OCCUPATION.	NUMBER OF VESSELS.			GROSS TONNAGE.			VALUE OF VESSELS.		
	1916	1906	Per cent of increase. ¹	1916	1906	Per cent of increase. ¹	1916	1906	Per cent of increase. ¹
Total.....	4,092	2,537	61.3	1,185,961	977,687	21.3	\$127,310,646	\$76,622,633	66.2
Steam ²	2,123	1,066	99.2	710,360	518,107	37.1	105,987,697	60,440,145	75.4
Freight and passenger.....	1,005	604	66.4	611,021	451,270	35.4	89,404,958	52,164,977	71.4
Tugs and other towing vessels.....	642	313	105.1	35,600	24,151	47.4	6,866,384	3,353,927	104.7
Ferryboats.....	76	47	.....	51,480	40,171	28.2	6,607,936	4,315,522	53.1
Yachts.....	293	66	.....	8,417	1,065	690.3	2,139,937	294,800	625.9
Miscellaneous.....	107	36	.....	3,842	1,450	165.0	968,482	310,919	211.5
Sail ³	296	666	-55.6	222,040	305,283	-27.3	13,259,661	11,533,171	15.0
Freight and passenger.....	264	547	-51.7	220,929	302,798	-27.0	13,169,036	11,275,586	16.8
Yachts.....	29	104	-72.1	892	1,459	-59.4	71,125	174,110	-59.1
Miscellaneous.....	3	15	.....	519	1,026	-49.4	19,500	83,475	-76.6
Unrigged.....	1,673	805	107.8	253,561	154,297	64.3	8,063,288	4,649,317	73.4

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

² Includes craft propelled by machinery.

³ Includes 13 schooner barges of 5,469 tons in 1916 and 9 schooner barges of 9,077 tons in 1906.

Steam vessels show a large increase, 99.2 per cent, and represent over one-half of the total number of all vessels in 1916, while the gross tonnage increased 37.1 per cent and the value 75.4 per cent, these two items in 1916 representing 59.9 per cent and 83.3 per cent of the respective totals for the Pacific coast.

Freight and passenger steam craft increased 66.4 per cent in number, 35.4 per cent in gross tonnage, and 71.4 per cent in value, and represented in 1916 almost half of the total number of all steam vessels and over eight-tenths of the tonnage and value of such vessels.

Steam tugs and other towing vessels increased 105.1 per cent in number, 47.4 per cent in gross tonnage, and 104.7 per cent in value, while they represented 30.2 per cent of the total number of steam craft and about one-twentieth of their tonnage and about one-sixteenth of their value.

Ferryboats show substantial increases, but the difference in their proportion of the total steam vessels is not so great. Yachts and miscellaneous craft were comparatively unimportant as to tonnage and value, although they show large increases.

The sail vessels showed a decrease since 1906 in number and tonnage. The freight vessels of the sailing fleet constituted 89.2 per cent of the total number of sailing craft, and 99.5 per cent and 99.3 per cent, respectively, of the tonnage and value of such craft.

The unrigged craft of the Pacific coast included all craft engaged in the transportation of freight and having no motive power, such as barges, scows, lighters, pile drivers, dredges, etc. This class of vessels shows a marked development during the 10 years covered by the table. The number of vessels increased 868, or 107.8 per cent, the tonnage 99,264 gross tons, or 64.3 per cent, and the value \$3,413,971, or 73.4 per cent. During the decade there was a gain in the Alaskan unrigged fleet of 432 vessels, resulting in an increased tonnage of 12,730 gross tons and an increased value of \$369,680. In 1916 the unrigged craft formed 40.9 per cent of the total number of vessels of all classes operating on the Pacific coast, including Alaska, and 21.4 per cent and 6.3 per cent, respectively, of their tonnage and value.

The following statement shows the number of sailing vessels on the Pacific coast in 1916 and 1906, by type or rig:

TYPE.	NUMBER OF VESSELS.		GROSS TONNAGE.	
	1916	1906	1916	1906
Total.....	296	666	222,040	305,283
Fore and aft rigged:				
Schooner ¹	188	443	96,426	140,156
Sloop.....	19	73	402	962
Yawl.....	5	13	79	199
Square rigged:				
Ship.....	21	34	38,293	60,681
Bark.....	30	49	53,412	65,546
Barkentine.....	30	46	32,540	35,904
Brig.....	1	3	252	1,101
Brigantine.....	1	2	496	706
Other craft.....	1	3	140	28

¹ Includes 13 vessels of the schooner barge type of 5,469 tons in 1916 and 9 of 9,077 tons in 1906.

The figures in this statement show a decrease in each of the 8 specified types of sailing vessels from 1906 to 1916, both in number and tonnage. The totals for all classes combined decreased 370, or 55.6 per cent, in number, and 83,243, or 27.3 per cent, in tonnage.

RAILWAY SHIPPING.

Table 5 shows the craft operated in connection with steam railroads for 1916 and 1906.

TABLE 5.—CRAFT OPERATED IN CONNECTION WITH STEAM RAILROADS: 1916¹ AND 1906.

	Total.	Steam. ²	Unrigged.
Number of vessels:			
1916.....	70	44	26
1906.....	88	38	50
Gross tonnage:			
1916.....	58,939	45,048	13,891
1906.....	51,419	38,188	13,231
Value of vessels:			
1916.....	\$6,550,574	\$6,150,019	\$400,555
1906.....	\$4,492,663	\$4,259,328	\$233,335
Number employed on vessels:			
1916.....	755	705	50
1906.....	788	733	55
Wages:			
1916.....	\$909,330	\$863,534	\$39,796
1906.....	\$744,070	\$696,223	\$47,847
Number of passengers carried:			
1916.....	40,774,965	40,774,965	.....
1906.....	35,996,163	35,996,163	.....

¹ Includes one electrified railroad. ² Includes craft propelled by machinery.

There were 28 ferryboats and 16 towing vessels comprising the steam part of the fleet in 1916, chiefly

employed in San Francisco Bay. The number of passengers carried by these railroad ferries represented 73.6 per cent of the total number of passengers reported by all vessels on the Pacific coast in 1916 and 81.5 per cent in 1906. The unrigged craft belonging to this fleet shows a decrease in number from the census of 1906, as small boats have been supplemented by a few larger ones of greater tonnage with a considerably greater average value.

GOVERNMENT VESSELS.

Table 6 presents statistics for vessels owned and operated by states and municipalities on the Pacific coast for 1916 and 1906.

TABLE 6.—VESSELS OWNED AND OPERATED BY STATE AND CITY GOVERNMENTS: 1916 AND 1906.

	Total.	Steam. ¹	Sail.	Un-rigged.
Number of vessels:				
1916.....	48	29	.....	19
1906.....	31	10	1	20
Gross tonnage:				
1916.....	9,804	5,809	.....	3,995
1906.....	3,988	1,463	54	2,471
Value of vessels:				
1916.....	\$1,945,276	\$1,029,727	.....	\$915,549
1906.....	\$688,728	\$269,000	\$4,000	\$415,728
Gross income:				
1916.....	\$481,026	\$222,965	.....	\$258,061
1906.....	\$184,747	\$2,000	.....	\$182,747
Number employed on vessels:				
1916.....	427	231	.....	196
1906.....	199	62	4	133
Wages:				
1916.....	\$429,525	\$263,576	.....	\$165,949
1906.....	\$160,636	\$62,106	\$190	\$98,340
Number of passengers carried:				
1916.....	2,652,830	2,599,091	.....	53,739
1906.....	1,156,000	1,156,000	.....	.....

¹ Includes craft propelled by machinery.

Various classes of vessels are represented under this form of ownership, such as ferries, fire boats, police boats, patrol boats, dredges, pile drivers, etc. The fleet includes four boats owned and operated as a free ferry by the city of Portland, Oreg., also four boats owned and operated as a free ferry by Coos County, Oreg. Nearly one-half of the total number of passengers carried by vessels operated by states and municipalities were credited to these eight boats.

FERRYBOATS.

Table 7 presents the statistics of ferryboats for the Pacific coast and the United States for 1916 and 1906.

TABLE 7.—FERRYBOATS: 1916 AND 1906.

	Census year.	Number of vessels.	Gross tonnage.	Value of vessels.	GROSS INCOME.			Number employed on vessels.	Wages.	Number of passengers carried.
					Total.	Passengers.	All other sources.			
United States.....	1916	611	224,328	\$23,227,174	\$15,414,979	\$10,223,408	\$5,191,571	4,282	\$3,947,836	292,177,374
	1906	536	261,073	29,578,350	17,291,073	10,414,106	6,876,967	4,519	3,537,180	330,737,639
Per cent of increase ¹		14.0	-14.1	-21.5	-10.9	-1.8	-24.5	-5.2	11.6	-11.7
Pacific coast.....	1916	76	51,480	6,607,936	3,259,556	2,216,001	1,043,555	825	964,080	48,280,569
	1906	47	40,171	4,315,522	4,208,430	2,037,580	2,170,850	759	708,777	39,532,354
Per cent of increase ¹.....		.....	28.2	53.1	-22.5	8.8	-51.9	8.7	36.0	22.1
Per cent of United States.....	1916	12.4	22.9	28.4	21.1	21.7	20.1	19.3	24.4	16.5
	1906	8.8	15.4	14.6	24.3	19.6	31.6	16.8	20.0	12.0

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

The percentages of increase for the Pacific coast were in excess of those for the United States as a whole, with the exception of the total income and that reported from "All other sources," for which items decreases are shown for both sections. In fact, except for number of vessels and wages, all items for ferryboats in the United States as a whole show decreases in 1916 as compared with 1906. A comparison for 1916 of the statistics for the Pacific coast with similar items for the whole country shows the proportions that the Pacific coast forms of the United States to be about as follows: Number of vessels, one-eighth; tonnage, one-fifth; valuation, one-fourth; gross income, one-fifth; number of employees, one-fifth; and number of passengers, one-sixth. The exact percentages are contained in Table 7.

FISHING CRAFT.

Table 8 presents statistics of the fishing fleet of the Pacific coast for boats of 5 tons and over net register for 1916.

A large number of the boats engaged in fishing are under 5 tons, and are not, therefore, included; consequently this table presents an approximation of the

magnitude of the fishing industry in the Pacific and Alaskan waters.

TABLE 8.—FISHING VESSELS: 1916.

	Total.	Steam.	Motor.	Sail.	Per cent motors are of total.
Number.....	870	72	778	20	89.4
Gross tonnage.....	29,342	7,503	17,798	4,041	60.7
Value of vessels.....	\$5,214,278	\$1,107,600	\$3,946,818	\$159,860	75.7
Gross income.....	\$4,814,991	\$1,212,872	\$3,258,550	\$343,569	67.7
Number employed on vessels.....	4,890	601	3,877	412	79.3
Wages.....	\$2,423,822	\$409,208	\$1,803,773	\$215,841	74.3

Of the 870 vessels reported, 778 were gasoline or motor, 72 steam, and 20 sailing vessels. The average gross tonnage for each class was: Motor 23, steam 104, and sail 202. The extent to which motor boats are used in the fishing industry is evidenced by the large relative proportions which are shown for such craft. But few of this fleet are used for any other purpose and after the fishing season they are berthed for the year.

OWNERSHIP OF VESSELS.

Table 9 presents statistics, by character of ownership, for steam and sail vessels for 1916, 1906, and 1889.

TABLE 9.—OWNERSHIP OF STEAM AND SAIL VESSELS: 1916, 1906, AND 1889.

CLASS AND OWNERSHIP.	NUMBER OF VESSELS.			GROSS TONNAGE.			VALUE OF VESSELS.		
	1916	1906	1889	1916	1906	1889	1916	1906	1889
Total.....	2,419	1,732	1,146	932,400	823,390	355,801	\$119,247,358	\$71,973,316	\$20,998,695
Steam ¹ and sail:									
Incorporated company.....	1,299	796	281	836,039	637,571	164,398	108,159,859	61,426,691	12,313,110
All other forms of ownership.....	1,120	936	865	96,361	185,819	191,403	11,087,499	10,546,625	8,685,585
Steam ¹	2,123	1,066	465	710,360	518,107	160,293	105,987,697	60,440,145	14,767,355
Incorporated company.....	1,144	609	221	661,253	477,815	127,498	97,412,223	55,560,485	11,575,605
All other forms of ownership.....	979	457	244	49,107	40,292	32,795	8,575,474	4,879,660	3,191,750
Sail.....	296	666	681	222,040	305,283	195,508	13,259,661	11,533,171	6,231,340
Incorporated company.....	155	187	60	174,786	159,756	36,900	10,747,636	5,866,206	737,505
All other forms of ownership.....	141	479	621	47,254	145,527	158,608	2,512,025	5,666,965	5,493,835
PER CENT OF TOTAL.									
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Steam ¹ and sail:									
Incorporated company.....	53.7	46.0	24.5	89.7	77.4	46.2	90.7	85.3	58.6
All other forms of ownership.....	46.3	54.0	75.5	10.3	22.6	53.8	9.3	14.7	41.4
Steam ¹	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Incorporated company.....	53.9	57.1	47.5	93.1	92.2	79.5	91.9	91.9	78.4
All other forms of ownership.....	46.1	42.9	52.5	6.9	7.8	20.5	8.1	8.1	21.6
Sail.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Incorporated company.....	52.4	28.1	8.8	78.7	52.3	18.9	81.1	50.9	11.8
All other forms of ownership.....	47.6	71.9	91.2	21.3	47.7	81.1	18.9	49.1	88.2

¹ Includes craft propelled by machinery.

The continued growth and increasing importance of corporate ownership are evident from the comparative data presented in Table 9. In 1889 only one-fourth of the number of vessels and craft reported were under corporate ownership, in 1906 the number was nearly one-half, but in 1916 the number was slightly over one-half. The gross tonnage for corporate ownership was less than one-half the total in 1889 and almost nine-tenths in 1916, while the value, nearly six-tenths in 1889, was nine-tenths in 1916.

Corporate ownership of the steam fleet which represented 47.5 per cent of the number of vessels in 1889 increased to 53.9 per cent in 1916; the tonnage of this

class increased from 79.5 per cent of the total tonnage in 1889 to 93.1 per cent in 1916, and the value from 78.4 per cent of the total in 1889 to 91.9 per cent in 1916.

The number of sailing vessels greatly predominated in "all other forms of ownership" in 1889 and in 1906, but in 1916 only 47.6 per cent were under this class of ownership. The tonnage and value, overwhelmingly under such ownership in 1889, were almost as greatly under corporate ownership in 1916.

Table 10 shows, by character of ownership, the number, tonnage, and value of steam, sail, and unrigged vessels for 1916 and 1906.

TABLE 10.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CLASS AND BY CHARACTER OF OWNERSHIP, WITH PER CENT OF INCREASE: 1916 AND 1906.

CLASS AND OWNERSHIP.	VESSELS.			TONNAGE.			VALUE OF VESSELS.		
	Number.		Per cent of increase. ¹	Gross tons.		Per cent of increase. ¹	Amount.		Per cent of increase. ¹
	1916	1906		1916	1906		1916	1906	
Total.....	4,092	2,537	61.3	1,185,961	977,687	21.3	\$127,310,646	\$76,622,633	66.2
Individual.....	1,069	806	32.6	72,626	119,565	-39.3	7,413,152	6,585,265	12.6
Firm.....	307	275	11.6	30,601	73,131	-58.2	3,012,390	3,678,325	-18.1
Incorporated company.....	2,653	1,404	89.0	1,065,530	770,404	38.3	114,539,028	65,235,015	75.6
All other.....	63	52		17,144	14,587	17.5	2,346,076	1,124,028	108.7
Steam ²	2,123	1,066	99.2	710,360	518,107	37.1	105,987,697	60,440,145	75.4
Individual.....	794	320	148.1	29,086	53,015	26.4	5,402,817	2,912,260	85.5
Firm.....	153	121	26.4	14,154	14,084	0.5	2,138,130	1,599,400	33.7
Incorporated company.....	1,144	609	87.8	661,253	477,815	38.4	97,412,223	55,560,485	75.3
All other.....	32	16		5,867	3,193	83.7	1,034,527	368,000	181.1
Sail.....	296	666	-55.6	222,040	305,283	-27.3	13,259,661	11,533,171	15.0
Individual.....	105	366	-71.3	31,748	85,227	-62.7	1,753,525	3,455,600	-49.3
Firm.....	25	99		8,494	51,721	-83.6	388,500	1,934,565	-79.9
Incorporated company.....	155	187	-17.1	174,786	159,756	9.4	10,747,636	6,866,206	83.2
All other.....	11	14		7,012	8,579	-18.3	370,000	276,800	33.7
Unrigged.....	1,673	805	107.8	253,561	154,297	64.3	8,063,288	4,649,317	73.4
Individual.....	170	120	41.7	11,792	11,323	4.1	256,810	217,405	18.1
Firm.....	129	55		7,853	7,326	8.6	485,769	144,360	236.5
Incorporated company.....	1,354	608	122.7	229,551	132,833	72.8	6,379,169	3,808,324	67.5
All other.....	20	22		4,265	2,815	51.5	941,549	479,228	96.5

¹ A minus sign (-) denotes decrease. Percentages are omitted when base is less than 100.

² Includes craft propelled by machinery.

Of the 4,092 vessels reported in 1916 for the Pacific coast, corporations controlled over three-fifths of the number and nearly nine-tenths of the tonnage and value. Individual ownership ranked second, while the proportions credited to firms and "all other" forms were unimportant. Steam vessels have increased their relative proportions of number, tonnage, and value since 1906 while, on the other hand, sail vessels not only show relative decreases in all three respects but also show actual decreases. The unrigged craft increased both actually and relatively.

NUMBER AND TONNAGE OF VESSELS.

Table 11, on page 124, shows steam, sail, and unrigged vessels, grouped according to gross tonnage for 1916 and 1906.

In 1916, of the total number of vessels, 3,810, or 93.1 per cent, were less than 1,000 gross tons each. The actual tonnage represented by this number was 489,142, or 41.2 per cent of the total tonnage. The

vessels of 1,000 tons and over numbered only 282, or 6.9 per cent, but this number represented 696,819 tons, or 58.8 per cent of the total tonnage reported for the Pacific coast. The largest tonnage for 1916 for any single group is in that of 1,000 to 2,499 tons, with a total of 200 vessels and 310,739 tons, the largest proportion of the tonnage for this group being for steam vessels. There were 34 vessels of over 5,000 tons each, all steam, representing a total of 224,320 tons, or 18.9 per cent of the tonnage of all vessels. The greater proportion of the unrigged craft were under 300 tons, only 14.8 per cent of the total number being of larger tonnage. The greater proportion (60.5 per cent) of sail vessels were over 500 tons, the tonnage being 206,239, or 92.9 per cent of the total.

CONSTRUCTION AND VALUATION.

Table 12, on page 124, shows the number, tonnage, and value of vessels, by occupation and character of construction, for 1916, 1906, and 1889.

TABLE 11.—VESSELS GROUPED ACCORDING TO GROSS TONNAGE: 1916 AND 1906.

TONNAGE.	TOTAL.		STEAM. ¹		SAIL.		UNRIGGED.	
	1916	1906	1916	1906	1916	1906	1916	1906
Total:								
Number of vessels.....	4,092	2,537	2,123	1,066	296	666	1,673	805
Gross tonnage.....	1,185,961	977,687	710,360	518,107	222,040	305,283	253,561	154,297
5 to 49 tons:								
Number of vessels.....	2,207	976	1,373	459	56	257	778	260
Gross tonnage.....	42,234	18,809	23,806	7,400	1,339	6,151	17,089	5,258
50 to 99 tons:								
Number of vessels.....	428	320	181	104	24	52	223	164
Gross tonnage.....	30,470	22,546	13,500	7,862	1,621	3,751	15,349	10,933
100 to 199 tons:								
Number of vessels.....	413	283	103	116	5	18	305	149
Gross tonnage.....	56,372	40,050	15,123	17,459	713	2,662	40,536	19,929
200 to 299 tons:								
Number of vessels.....	197	155	71	62	7	24	119	69
Gross tonnage.....	47,780	37,591	17,553	15,121	1,855	6,298	28,372	16,172
300 to 399 tons:								
Number of vessels.....	106	118	51	60	11	30	44	28
Gross tonnage.....	35,736	40,612	17,343	20,512	3,788	10,429	14,605	9,671
400 to 499 tons:								
Number of vessels.....	175	98	45	50	14	30	116	18
Gross tonnage.....	76,247	44,079	19,989	22,324	6,485	13,804	49,773	7,951
500 to 999 tons:								
Number of vessels.....	284	361	133	105	98	156	53	100
Gross tonnage.....	200,303	243,497	96,142	71,257	66,850	108,095	37,311	64,145
1,000 to 2,499 tons:								
Number of vessels.....	200	177	93	62	73	98	34	17
Gross tonnage.....	310,739	271,166	148,902	99,677	114,341	151,251	47,496	20,238
2,500 to 4,999 tons:								
Number of vessels.....	48	34	39	33	8	1	1	.....
Gross tonnage.....	161,760	109,680	133,682	106,838	25,048	2,842	3,030	.....
5,000 tons and over:								
Number of vessels.....	34	15	34	15	.....	.....	.....	.....
Gross tonnage.....	224,320	149,657	224,320	149,657	.....	.....	.....	.....

¹ Includes craft propelled by machinery.

TABLE 12.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CLASS AND OCCUPATION AND BY CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.

CLASS AND OCCUPATION.	Census year.	TOTAL.			METAL.			WOOD.			COMPOSITE.		
		Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.
Aggregate.....	1916	4,092	1,185,961	\$127,310,646	242	560,486	\$85,982,587	3,846	624,064	\$41,142,417	4	1,411	\$185,642
	1906	2,537	977,687	76,622,633	130	354,134	41,375,742	2,404	622,606	35,168,891	3	947	78,000
	1889	1,655	419,157	21,824,040	23	48,121	6,613,065	1,610	369,738	15,100,975	2	1,298	110,000
Steam ¹	1916	2,123	710,360	105,987,697	186	467,830	76,628,858	1,934	241,205	29,183,197	3	1,325	175,642
	1906	1,066	518,107	60,440,145	105	318,995	39,702,536	959	198,279	20,664,609	2	833	73,000
	1889	465	160,293	14,767,355	22	47,124	6,573,065	442	112,080	8,094,290	1	1,089	100,000
Freight and passenger.....	1916	1,005	611,021	89,404,958	146	445,029	70,721,999	857	165,467	18,605,254	2	525	77,705
	1906	604	451,270	52,164,977	86	313,217	38,553,013	517	137,634	13,561,964	1	419	60,000
	1889	354	129,491	12,660,755	17	46,140	6,398,065	336	82,262	6,162,690	1	1,089	100,000
Tugs and other towing vessels.....	1916	642	35,600	6,866,384	21	4,565	2,087,664	621	31,035	4,778,720	.....	.....	.....
	1906	313	24,151	3,935,927	14	2,482	623,194	299	21,669	2,730,733	.....	.....	.....
	1889	70	6,109	1,120,800	4	569	135,000	66	5,540	985,800	.....	.....	.....
Ferryboats.....	1916	76	51,480	6,607,936	9	14,036	2,341,001	66	36,644	4,168,998	1	800	97,937
	1906	47	40,171	4,315,522	2	2,964	450,000	44	36,793	3,842,522	1	414	23,000
	1889	38	24,630	979,300	1	415	40,000	37	24,215	939,300	.....	.....	.....
Yachts.....	1916	293	8,417	2,139,937	7	3,685	1,184,000	286	4,732	955,937	.....	.....	.....
	1906	66	1,065	294,800	1	102	17,000	65	963	277,800	.....	.....	.....
	1889	3	63	6,500	.....	.....	.....	3	63	6,500	.....	.....	.....
Miscellaneous.....	1916	107	3,842	968,482	3	515	294,194	104	3,327	674,288	.....	.....	.....
	1906	36	1,450	310,919	2	230	59,329	34	1,220	251,590	.....	.....	.....
Sail.....	1916	296	222,040	13,259,661	34	70,645	7,898,000	261	151,309	5,351,661	1	86	10,000
	1906	666	305,283	11,533,171	20	31,848	1,642,206	645	273,321	9,885,065	1	114	6,000
	1889	681	195,508	6,231,340	1	997	40,000	679	194,302	6,181,340	1	209	10,000
Freight and passenger.....	1916	264	220,929	13,169,036	34	70,645	7,898,000	230	150,284	5,271,036	.....	.....	.....
	1906	547	302,798	11,275,586	20	31,848	1,642,206	527	270,950	9,633,380	.....	.....	.....
	1889	647	194,478	6,112,340	1	997	40,000	645	193,272	6,062,340	1	209	10,000
Yachts.....	1916	29	592	71,125	.....	.....	.....	28	506	61,125	1	86	10,000
	1906	104	1,459	174,110	.....	.....	.....	104	1,459	174,110	.....	.....	.....
	1889	25	612	69,300	.....	.....	.....	25	612	69,300	.....	.....	.....
Miscellaneous.....	1916	3	519	19,500	.....	.....	.....	3	519	19,500	.....	.....	.....
	1906	15	1,026	83,475	.....	.....	.....	14	912	78,475	1	114	5,000
	1889	9	418	49,700	.....	.....	.....	9	418	49,700	.....	.....	.....
Unrigged ²	1916	1,673	253,561	8,063,288	22	22,011	1,455,729	1,651	231,550	6,607,559	.....	.....	.....
	1906	805	154,297	4,649,317	5	3,291	31,000	800	151,006	4,618,317	.....	.....	.....
	1889	489	63,356	825,345	.....	.....	.....	489	63,356	825,345	.....	.....	.....

¹ Includes craft propelled by machinery.² The character of construction was not reported in 1889, but for purposes of comparison in this table all vessels are assumed to be of wood.

DIAGRAM 4.—GROSS TONNAGE OF VESSELS BY CLASS AND CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.

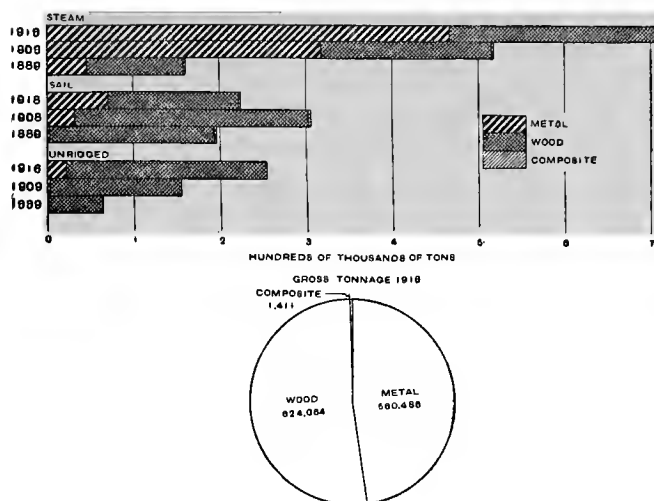
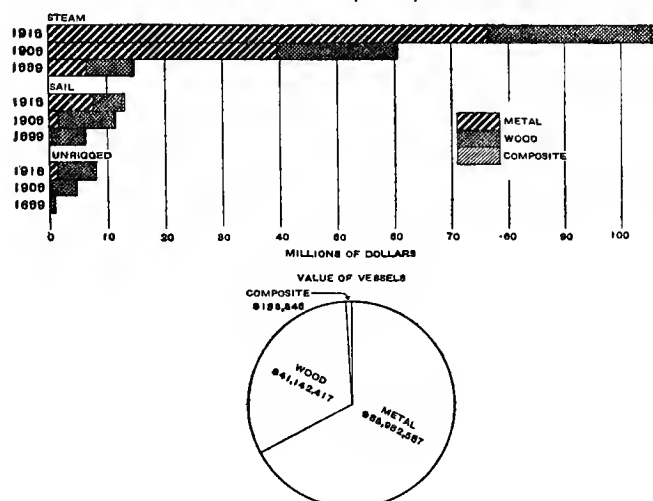


DIAGRAM 5.—VALUE OF VESSELS BY CLASS AND CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.



At each census the largest number and tonnage was reported for wooden vessels, although the proportion for tonnage was smaller at each census. The value of metal vessels, however, which was less than one-half that of wooden vessels in 1889, had assumed the leading position in 1906, and in 1916 amounted to more than double the value of wooden vessels. Freight and passenger vessels represent most of this increase in the value of metal vessels, this class reporting 61.8 per cent of the total value of all vessels on the Pacific coast in 1916, as compared with 52.5 per cent in 1906, and 29.5 per cent in 1889. These vessels have increased 69.8 per cent in number since 1906, 49.4 per cent in tonnage, and 95.6 per cent in value.

Freight and passenger vessels of wooden construction have not shown as great a growth in tonnage and value since 1906 as from 1889 to 1906. Their value in 1916, steam and sail, was \$23,876,290, or 18.8 per cent of the value of all vessels, as compared with

\$23,195,344, or 30.3 per cent, in 1906 and \$12,225,030, or 56 per cent, in 1889.

Ferryboats increased 53.1 per cent in value from 1906 to 1916, their value in 1916, \$6,607,936, being 5.2 per cent of the value of all vessels on the Pacific coast as compared with \$4,315,522, or 5.6 per cent, in 1906, and \$979,300, or 4.5 per cent, in 1889. Wood still predominates as material for construction of these boats, 66 vessels of 36,644 tons being of wooden construction in 1916, representing 86.8 per cent of the number and 71.2 per cent of the total tonnage of vessels of this class.

Tugs and other towing vessels also were mostly of wooden construction at all three censuses, only 21 vessels of 4,565 tons being reported of metal construction in 1916 out of a total of 642 vessels of 35,600 tons.

Unrigged craft were also largely of wooden construction. In 1916 the vessels of metal construction formed but 1.3 per cent of all unrigged craft, 8.7 per cent of the total tonnage, and 18.1 per cent of the total value. Seventeen large metal barges, used largely for the movement of petroleum, were added to the fleet during the decade 1906–1916.

Table 13 shows the number, tonnage, and value of steam, sail, and unrigged vessels, by character of construction, for 1916, 1906, and 1889.

At the census of 1916, as compared with that of 1906, the actual increase in number of vessels of metal construction was but 112, while the gain in wooden vessels was 1,442, the percentage of gain being 86.2 and 60 per cent, respectively. The increase in tonnage for the same period was 206,352 tons, or 58.3 per cent, for vessels of metal construction and 1,458 tons, or two-tenths of 1 per cent, for those of wooden construction. The steam vessels show increases for both metal and wood in number, in tonnage, and in value; in fact, most of the gain is shown in this class. From 1906 to 1916 the sail vessels of metal construction show increases in number, tonnage, and value, while decreases in all three respects are shown for those of wood.

In total value, metal construction of all types showed a gain of \$44,606,845, or 107.8 per cent, from 1906 to 1916, while for wood the gain was only \$5,973,526, or 17 per cent. In 1889 there were but 22 steam vessels and 1 sailing craft of metal construction on the Pacific coast, while in 1916 there were 186 steamers and 34 sailing vessels of this construction. The steamers represented about two-fifths and the sailing vessels about one-sixteenth of the total tonnage on the Pacific coast in 1916. The total tonnage of all the metal craft represented nearly one-half of the total tonnage reported for the Pacific coast in 1916.

Table 14, on page 126, shows the average tonnage, value per ton and per vessel, by character of construction and occupation, for 1916, 1906, and 1889.

TRANSPORTATION BY WATER.

TABLE 13.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CLASS AND BY CHARACTER OF CONSTRUCTION, WITH PER CENT OF TOTAL AND PER CENT OF INCREASE: 1916, 1906, AND 1889.

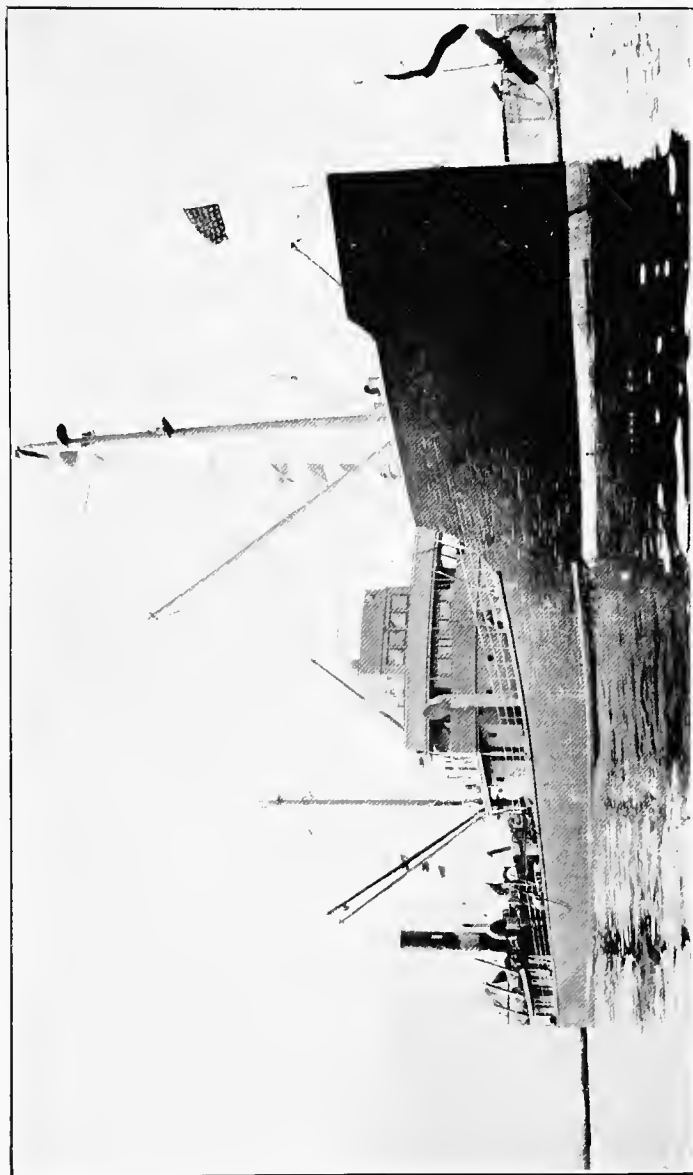
	Census year.	Aggregate.	TOTAL.			STEAM. ¹			SAIL.			UNRIGGED. ²	
			Metal.	Wood.	Com- posite.	Metal.	Wood.	Com- posite.	Metal.	Wood.	Com- posite.	Metal.	Wood.
Number of vessels.....	1916	4,092	242	3,846	4	186	1,934	3	34	261	1	22	1,651
	1906	2,537	130	2,404	3	105	959	2	20	645	1	5	800
	1889	1,635	23	1,610	2	22	442	1	1	679	1		489
Percent of total....	1916	100.0	5.9	94.0	0.1	8.8	91.1	0.1	11.5	88.2	0.3	1.3	98.7
	1906	100.0	5.1	94.8	0.1	9.8	90.0	0.2	3.0	96.8	0.2	0.6	99.4
	1889	100.0	1.4	98.5	0.1	4.7	95.1	0.2	0.1	99.7	0.1		100.0
Percent of increase ³	1906-1916	61.3	86.2	60.0		77.1	101.7			-59.5			106.4
	1889-1916	150.3		138.9			337.6			-61.6			237.6
Gross tonnage.....	1916	1,185,961	560,486	624,064	1,411	467,830	241,205	1,325	70,645	151,309	86	22,011	231,550
	1906	977,687	354,134	622,606	947	318,935	198,279	833	31,848	273,321	114	3,291	151,006
	1889	419,137	48,121	369,738	1,298	47,124	112,080	1,089	997	194,302	209		63,556
Percent of total....	1916	100.0	47.3	52.6	0.1	65.8	34.0	0.2	31.8	68.1	(4)	8.7	91.3
	1906	100.0	36.2	63.7	0.1	61.6	38.3	0.2	10.4	89.5	(4)	2.1	97.9
	1889	100.0	11.5	88.2	0.3	29.4	69.9	0.7	0.5	99.4	0.1		100.0
Percent of increase ³	1906-1916	21.3	58.3	0.2	49.0	46.6	21.6	59.1	121.8	-44.6	-24.6	568.8	53.3
	1889-1916	182.9	1,064.7	68.8	8.7	892.8	115.2	21.7	6,955.8	-22.1	-58.9		265.5
Value of vessels.....	1916	\$127,310,646	\$85,982,587	\$41,142,417	\$185,642	\$76,628,858	\$29,183,197	\$175,642	\$7,898,000	\$5,351,661	\$10,000	\$1,455,729	\$6,607,559
	1906	\$76,622,633	\$41,375,742	\$35,168,891	\$78,000	\$39,702,536	\$20,664,609	\$73,000	\$1,642,206	\$9,885,965	\$5,000	\$31,000	\$4,618,317
	1889	\$21,824,040	\$6,613,065	\$15,100,975	\$110,000	\$6,573,065	\$8,094,290	\$100,000	\$40,000	\$6,181,340	\$10,000		\$825,345
Percent of total....	1916	100.0	67.5	32.3	0.1	72.3	27.5	0.2	59.6	40.4	0.1	18.1	81.9
	1906	100.0	54.0	45.9	0.1	65.7	34.2	0.1	14.2	85.7	(4)	0.7	99.3
	1889	100.0	30.3	69.2	0.5	44.5	54.8	0.7	0.6	99.2	0.2		100.0
Percent of increase ³	1906-1916	66.2	107.8	17.0	138.0	93.0	41.2	140.6	380.9	-45.9	100.0	4,595.9	43.1
	1889-1916	483.4	1,200.2	172.4	68.8	1,065.8	260.5	75.6		-13.4			700.6

¹ Includes craft propelled by machinery.² The character of construction of unriggered craft was not reported in 1889, but for purposes of comparison in this table all were assumed to be of wood.³ A minus sign (-) denotes decrease. Percentages are omitted when base is less than 100.⁴ Less than one-tenth of 1 per cent.

TABLE 14.—AVERAGE GROSS TONNAGE AND VALUE PER VESSEL AND AVERAGE VALUE PER GROSS TON: 1916, 1906, AND 1889.

CLASS AND OCCUPATION.	Census year.	TOTAL.			METAL.			WOOD.			COMPOSITE.		
		Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.
Aggregate.....	1916	290	\$31,112	\$107	2,316	\$355,300	\$153	162	\$10,697	\$66	353	\$46,411	\$132
	1906	385	30,202	78	2,724	318,275	117	259	14,629	56	316	26,000	82
	1889	256	13,348	52	2,092	287,525	137	230	9,379	41	649	55,000	85
Steam ¹	1916	335	49,924	149	2,515	411,983	164	125	15,090	121	442	58,547	133
	1906	486	56,698	117	3,038	378,119	124	207	21,548	104	417	36,500	88
	1889	345	31,758	92	2,142	298,776	139	254	18,313	72	1,089	100,000	92
Freight and passenger.....	1916	608	88,960	146	3,048	484,397	159	193	21,710	112	263	38,853	148
	1906	747	86,366	116	3,642	448,291	123	266	26,232	99	419	50,000	119
	1889	366	35,765	98	2,714	376,357	139	245	18,341	75	1,089	100,000	92
Tugs and other towing vessels.....	1916	55	10,695	193	217	99,413	457	50	7,695	154			
	1906	77	10,715	139	177	44,514	251	72	9,133	126			
	1889	87	16,011	183	142	33,750	237	84	14,936	178			
Ferryboats.....	1916	677	86,947	128	1,560	260,111	167	556	63,167	114	800	97,937	122
	1906	855	91,820	107	1,482	225,000	152	836	87,330	104	414	23,000	56
	1889	648	25,771	40	415	40,000	96	654	25,386	39			
Yachts.....	1916	29	7,304	254	526	169,143	321	17	3,342	202			
	1906	16	4,467	277	102	17,000	167	15	4,274	288			
	1889	21	2,167	103				21	2,167	103			
Miscellaneous.....	1916	36	9,051	252	172	98,065	571	32	6,484	203			
	1906	40	8,637	214	115	29,665	258	36	7,400	206			
Sail.....	1916	750	44,796	60	2,078	232,294	112	580	20,504	35	86	10,000	116
	1906	458	17,317	38	1,592	82,110	52	424	15,327	36	114	6,000	44
	1889	287	9,150	32	997	40,000	40	286	9,104	32	209	10,000	48
Freight and passenger.....	1916	837	49,883	60	2,078	232,294	112	553	22,918	35			
	1906	654	20,614	37	1,592	82,110	52	514	18,280	36			
	1889	301	9,447	31	997	40,000	40	300	9,399	31	209	10,000	48
Yachts.....	1916	20	2,453	120				18	2,183	121			
	1906	14	1,674	119				14	1,674	119			
	1889	24	2,772	113				24	2,772	113			
Miscellaneous.....	1916	173	6,500	38				173	6,500	38			
	1906	68	5,565	81				65	6,605	86	114	5,000	44
	1889	46	5,522	119				46	5,522	119			
Unrigged.....	1916	152	4,820	32	1,001	66,170	66	140	4,002	29			
	1906	192	6,776	30	658	6,200	9	189	6,773	31			
	1889	130	1,688	13				130	1,688	13			

¹ Includes craft propelled by machinery.



STEAMER "FAITH"—CONCRETE CONSTRUCTION.

The freight and passenger class and the unrigged craft, which together represented about nine-tenths of the entire tonnage and comprised practically all of the freight-carrying vessels in 1916, show decreases since 1906 in the average tonnage per vessel for steam and in the unrigged craft. This decrease in the steam vessels was due primarily to the fact that several large steamers were idle during 1916. From 1906 to 1916 the average tonnage for freight and passenger sailing vessels increased 283 tons, or 51.1 per cent, this increase being due largely to the gain in those of metal construction. The average value of the freight and passenger vessels increased as follows: Steam, \$2,594, or 3 per cent, and sail \$29,269, or 142 per cent, while the average value for the unrigged vessels decreased \$956, or 16.6 per cent. The metal freight and passenger vessels propelled by steam showed the largest average tonnage and also the largest average value in 1916 as in 1906 and 1889. Metal sailing vessels of this class ranked second in average tonnage and third in average value. From 1906 to 1916 there was a decrease of 594 tons, or 16.3 per cent, in the average tonnage of metal freight and passenger steamers. The wooden vessels of this class showed a decrease also, as did

those of composite construction. During the same ten-year period the metal freight and passenger sail vessels made an average gain of 486 tons, or 30.5 per cent. Of metal built vessels, steam yachts showed the most marked increase since 1906, the gain in average tonnage being 424, or 415.7 per cent, and in average value, \$152,143, or 895 per cent. Ferryboats as a whole decreased from 1906 to 1916, all of the decrease being in those of wooden construction. Tugs and other towing vessels as a whole also showed decreases except in value per ton, but those of metal construction increased 40 tons, or 22.6 per cent, in average size and \$54,899, or 123.3 per cent, in average value, while those of wooden construction decreased.

From 1906 to 1916 unrigged craft showed decreases for the total and for those of wooden construction, but for craft of metal construction there was an increase of 343 tons, or 52.1 per cent, in average size, and \$59,970, or 967.3 per cent, in average value.

CHARACTER OF PROPULSION AND HORSEPOWER.

Table 15 shows the number, gross tonnage, and horsepower of vessels propelled by machinery, by character of propulsion, for 1916 and 1906.

TABLE 15.—NUMBER, GROSS TONNAGE, AND HORSEPOWER OF VESSELS, BY CHARACTER OF PROPULSION AND POWER, WITH AVERAGE TONNAGE AND HORSEPOWER: 1916 AND 1906.

PROPULSION AND POWER.	NUMBER OF VESSELS.			GROSS TONNAGE.			HORSEPOWER.			AVERAGE TONNAGE.		AVERAGE HORSEPOWER.	
	1916	1906	Per cent of increase. ¹	1916	1906	Per cent of increase. ¹	1916	1906	Per cent of increase. ¹	1916	1906	1916	1906
Total.....	2,123	1,066	99.2	710,360	518,107	37.1	672,858	445,717	51.0	335	486	317	418
Steam.....	726	725	0.1	669,911	511,607	30.9	605,868	435,020	39.3	923	706	834	600
Gasoline.....	1,397	341	309.7	40,449	6,500	522.3	67,090	10,697	527.2	29	19	48	31
Screw.....	1,922	837	129.6	603,404	415,100	45.4	583,197	367,875	58.5	314	496	303	440
Steam.....	542	507	6.9	563,908	408,849	37.9	517,037	357,503	44.6	1,040	806	954	705
Gasoline.....	1,380	330	318.2	39,496	6,251	531.8	66,160	10,372	537.9	29	19	48	31
Stern wheel.....	153	191	-19.9	53,783	67,539	-20.4	51,538	54,479	-5.4	352	354	337	285
Steam.....	146	184	-20.7	53,625	67,364	-20.4	51,071	54,271	-5.9	367	366	350	293
Gasoline.....	7	7	.....	158	175	-9.7	467	208	124.5	23	25	67	30
Side wheel.....	48	38	.....	53,173	35,468	49.9	38,223	23,363	63.6	1,108	933	796	615
Steam.....	38	34	.....	52,378	35,394	48.0	37,760	23,246	62.4	1,378	1,041	994	684
Gasoline.....	10	4	.....	795	74	.....	463	117	295.7	80	19	46	29

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

Of the total number of vessels in 1916, 726, or 34.2 per cent, were steamers and 1,397, or 65.8 per cent, used gasoline as compared with 725 steamers and 341 gasoline vessels in 1906, the proportion of the number of gasoline vessels increasing from 32 per cent in 1906 to 65.8 per cent in 1916.

Steam vessels represented 669,911 tons, or 94.3 per cent of the total tonnage in 1916 and 605,868 horsepower, or 90 per cent of the horsepower; the comparative figures for 1906 were 511,607 tons, or 98.7 per cent of the total tonnage and 435,020 horsepower, or 97.6 per cent of the total amount. The gasoline vessels represented 5.7 per cent of the tonnage and 10 per cent of the horsepower in 1916, as compared with 1.3 per cent of the tonnage and 2.4 per cent of the horsepower in 1906. The screw-pro-

elled vessels formed 90.5 per cent of all vessels propelled by machinery in 1916, stern-wheelers 7.2 per cent, and side-wheelers 2.3 per cent, the corresponding percentages for 1906 being 78.5, 17.9, and 3.6, respectively. The tonnage of these vessels in 1916 formed 84.9 per cent, 7.6 per cent, and 7.5 per cent, respectively, of the total tonnage; in 1906 the percentages were 80.1, 13, and 6.8, respectively, of the total tonnage. The horsepower of the screw propellers formed 86.7 per cent of the total in 1916 and 82.5 per cent in 1906; stern-wheelers, 7.7 per cent in 1916 and 12.2 per cent in 1906; and side-wheelers, 5.7 per cent in 1916 and 5.2 per cent in 1906.

The side-wheel vessels greatly exceed all other classes in average tonnage and horsepower.

Table 16 shows for vessels propelled by machinery, their occupation, and the character of propulsion and horsepower of engines for 1916 and 1906.

TABLE 16.—CHARACTER OF PROPULSION AND HORSEPOWER OF VESSELS PROPELLED BY MACHINERY, BY OCCUPATION: 1916 AND 1906.

OCCUPATION AND CENSUS YEAR.	CHARACTER OF PROPULSION.				HORSEPOWER OF ENGINES		
	Total (number).	Screw (number).	Side wheel (number).	Stern wheel (number).	Total.	Steam.	Gasoline.
Total:							
1916.....	2,123	1,922	48	153	672,958	605,868	67,090
1906.....	1,066	837	38	191	445,717	435,020	10,697
Freight and passenger:							
1916.....	1,005	895	11	99	520,256	490,825	29,431
1906.....	604	455	5	144	362,182	355,849	6,333
Tugs and other towing vessels:							
1916.....	642	593	—	49	84,646	62,394	22,252
1906.....	313	272	2	39	50,284	47,764	2,520
Ferryboats:							
1916.....	76	36	35	5	44,374	42,591	1,783
1906.....	47	10	31	6	29,165	29,079	86
Yachts:							
1916.....	293	293	—	—	16,814	8,173	8,641
1906.....	66	66	—	—	2,047	810	1,237
Miscellaneous:							
1916.....	107	105	2	—	6,868	1,885	4,983
1906.....	36	34	—	2	2,039	1,518	521

The freight and passenger vessels formed the most numerous class, constituting 47.3 per cent of the total number of all classes of craft and reporting 77.3 per cent of the total horsepower. These figures represent a slight relative decrease from 1906, when the percentages were 56.7 and 81.3, respectively. Of the 1,005 freight and passenger vessels in 1916, 89.1 per cent were equipped with screw propellers, 9.9 per cent were stern-wheelers, and 1.1 per cent were side-wheelers, compared with 75.3 per cent, 23.8 per cent, and eight-tenths of 1 per cent, respectively, in 1906.

Tugs and towing vessels also had a large proportion of screw propellers, 92.4 per cent in 1916 and 86.9 per cent in 1906; only 7.6 per cent of the total number of tugs in 1916 being stern-wheelers, compared with 12.5 per cent in 1906. There were no side-wheelers reported for this class in 1916, and but two in 1906.

Ferryboats embraced most of the side-wheel craft in 1916 as in 1906, 72.9 per cent of all side-wheelers being ferryboats in 1916 as compared with 81.6 per cent in 1906. Whereas side-wheel was the most numerous class of ferryboats in 1906, in 1916 it was surpassed by screw-propelled craft, this class forming 47.4 per cent of all ferryboats.

The increase in the horsepower of internal-combustion engines is a noticeable feature of this table, the increase for the decade amounting to over 500 per cent for all vessels combined. The largest actual increases in horsepower for gasoline vessels occurred in the freight and passenger and the tugs and towing vessels, while ferryboats, although showing only a small actual gain, showed the largest per cent of increase.

INCOME.

Table 17 shows the gross income, by classes and occupation, for 1916 and 1906.

TABLE 17.—GROSS INCOME—ALL VESSELS, EXCLUSIVE OF FISHING VESSELS, BY CLASS AND OCCUPATION, WITH PER CENT OF INCREASE: 1916 AND 1906.

CLASS, OCCUPATION, AND CENSUS YEAR.	Total.	Freight.	Passenger.	All other.
Total:				
1916.....	\$80,215,193	\$56,561,447	\$11,571,416	\$12,082,330
1906.....	48,520,139	29,340,102	10,424,493	8,755,544
Per cent of increase.	65.3	92.8	11.0	38.0
Steam: ¹				
1916.....	66,855,181	46,149,083	11,571,416	9,134,682
1906.....	37,287,470	20,600,325	10,414,347	6,272,798
Per cent of increase.	79.3	124.0	11.1	45.6
Freight and passenger:				
1916.....	57,266,548	45,918,718	9,312,452	2,035,378
1906.....	29,692,075	20,065,562	8,365,559	1,260,954
Per cent of increase.	92.9	128.8	11.3	61.4
Tugs and other towing vessels:				
1916.....	6,019,784	228,858	40,996	5,749,930
1906.....	3,305,938	534,463	10,208	2,761,267
Per cent of increase ²	82.1	-57.2	301.6	108.2
Ferryboats:				
1916.....	3,259,556	—	2,216,001	1,043,555
1906.....	4,208,430	—	2,037,580	2,170,850
Per cent of increase ²	-22.6	—	8.8	-51.9
Yachts:				
1916.....	47,951	—	—	47,951
1906.....	2,500	—	—	2,500
Per cent of increase.	1,818.0	—	—	1,818.0
Miscellaneous:				
1916.....	261,342	1,507	1,967	257,868
1906.....	78,527	300	1,000	77,227
Per cent of increase.	232.8	402.3	96.7	233.9
Sail:				
1916.....	8,065,860	7,725,329	—	340,531
1906.....	8,299,751	8,090,122	10,146	199,483
Per cent of increase ²	-2.8	-4.5	—	70.7
Freight and passenger:				
1916.....	8,064,360	7,725,329	—	339,031
1906.....	8,277,779	8,090,007	10,146	177,626
Per cent of increase ²	-2.6	-4.5	—	90.9
Yachts:				
1916.....	—	—	—	—
1906.....	100	—	—	100
Per cent of increase.	—	—	—	—
Miscellaneous:				
1916.....	1,500	—	—	1,500
1906.....	21,872	115	—	21,757
Per cent of increase ² .	-93.2	—	—	-93.1
Unrigged:				
1916.....	5,294,152	2,687,035	—	2,607,117
1906.....	2,932,918	649,655	—	2,283,263
Per cent of increase.	80.5	313.6	—	14.2

¹ Includes craft propelled by machinery.

² A minus sign (—) denotes decrease.

It is not claimed that this income is absolutely correct, but from a careful and intelligent canvass it is believed to be a conservative presentation of the facts.

Of the total income for 1916, 70.5 per cent was derived from freight and 14.4 per cent from passengers, the corresponding figures for 1906 being 60.5 and 21.5 per cent, respectively. The income reported for the steam freight and passenger vessels was much the largest, both in 1916 and 1906—\$57,266,548, or 71.4 per cent of the total income, in 1916, and \$29,692,075, or 61.2 per cent, in 1906. In 1916 the income from sailing vessels of this class formed but 10.1 per cent of the total, compared with 17.1 per cent in 1906. The combined income for freight and passenger vessels was \$65,330,908, or 81.4 per cent of the total income, in 1916 and \$37,969,854, or 78.3 per cent, in 1906.

The income reported for tugs and other towing vessels amounted to \$6,019,784, or 7.5 per cent of the total income, in 1916, and \$3,305,938, or 6.8 per cent, in 1906. A considerable decrease is shown for the freight service, but taking into consideration the fact that at both censuses these amounts represent, to a greater or less degree, income from freight that was actually carried on unriggered craft, the decrease has little significance. Where the tug and the tow were controlled by the same ownership, the income was generally reported for the tug; whereas if controlled by different ownerships, the tug was credited with the towing charges and the unriggered craft was credited with the income. The income reported by tugs under "All other" was mostly for towing. A better idea, therefore, of the conditions pertaining to income for tugs and unriggered craft is obtained by combining the two classes. The result of such a combination shows that from 1906 to 1916 there was an increase in the income for freight of \$1,731,775, or 146.3 per cent.

The income for ferryboats decreased between 1906 and 1916, forming only 4.1 per cent of the total income in 1916, compared with 8.7 per cent in 1906. Unriggered craft reported an income that represented 6.6 per cent of the total in 1916 and 6 per cent in 1906. The income for unriggered craft as reported under "All other" represented largely lighterage, or harbor work, to distinguish it from freight shipments. In addition to representing towing charges and lightering, "All other" income includes considerable amounts for dredging, pile driving, chartered vessels, etc. The income for unriggered craft was about evenly divided in 1916 between freight and "All other," whereas in 1906 "All other" represented the bulk of the income.

EMPLOYEES AND SALARIES AND WAGES.

Table 18 shows for steam, sail, and unriggered vessels the total number of employees and salaries and wages, with per cent of increase, for 1916 and 1906.

TABLE 18.—EMPLOYEES AND SALARIES AND WAGES, WITH PER CENT OF INCREASE: 1916 AND 1906.

	Census year.	TOTAL.		STEAM. ¹		SAIL.		UNRIGGERED.	
		Number of employees.	Salaries and wages.	Number of employees.	Salaries and wages.	Number of employees.	Salaries and wages.	Number of employees.	Salaries and wages.
Total.....	1916	32,046	\$24,350,064	25,930	\$21,074,988	4,230	\$1,993,550	1,886	\$1,281,526
	1906	25,519	17,190,022	17,954	12,786,638	5,972	3,213,438	1,593	1,179,946
Per cent of increase ²		25.6	41.6	44.4	64.7	-29.2	-38.0	18.4	8.6
On vessels.....	1916	23,576	18,055,141	18,500	15,232,382	3,562	1,688,208	1,514	1,134,651
	1906	20,142	12,950,399	14,423	9,330,294	4,461	2,719,571	1,238	900,534
Per cent of increase ²		17.0	39.4	28.3	63.2	-20.5	-37.9	22.3	26.0
On land.....	1916	8,470	6,294,923	7,430	5,842,606	668	305,342	372	146,975
	1906	5,377	4,239,623	3,531	3,466,344	1,491	493,867	355	279,412
Per cent of increase ²		57.5	48.5	110.4	68.6	-55.2	-38.2	4.8	-47.4
Officers, managers, clerks, etc.....	1916	2,592	2,410,693	2,348	2,262,801	179	92,022	65	55,870
	1906	1,853	1,768,849	1,678	1,641,438	159	98,643	16	28,768
Per cent of increase ²		39.9	36.3	39.9	37.8	12.6	-6.7	.....	94.2
All other.....	1916	5,878	3,884,230	5,082	3,579,805	489	213,320	307	91,105
	1906	3,524	2,470,774	1,853	1,824,906	1,332	385,224	339	250,644
Per cent of increase ²		66.8	57.2	174.2	96.2	-63.3	-46.0	-9.4	-63.7

¹ Includes craft propelled by machinery.

² A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

The land employees are divided into two classes, one representing officers, managers, clerks, etc., and the other embracing chiefly laborers, stevedores, and long-shoremen. Those employed on vessels represent the total, irrespective of rank or duties.

The employees on vessels in 1916 formed 73.6 per cent of the total number of employees of all classes, and their salaries and wages amounted to 74.1 per cent of the total. The corresponding percentages for 1906 were 78.9 and 75.3, respectively. Of the employees of all classes, in 1916, 80.9 per cent were connected with steam vessels, 13.2 per cent with

sailing vessels, and 5.9 per cent with unriggered craft. The distribution of salaries and wages in 1916 was 86.6 per cent for steam vessels, 8.2 per cent for sailing vessels, and 5.3 per cent for unriggered craft. As in most other respects, general decreases are shown both for number and salaries and wages for sailing vessels.

FREIGHT.

Table 19 shows, for each of the principal ports and for Alaska the shipments and receipts of freight, by commodities, for 1916.

TABLE 19.—SHIPMENTS AND RECEIPTS OF PRINCIPAL COMMODITIES BY SELECTED PORTS: 1916.

COMMODITY.	Total.	Los Angeles.	Portland.	Sacramento.	San Francisco.	Seattle.	Stockton.	Tacoma.	Alaska.	All other United States ports.	Foreign.
Total:											
Shipments..... tons ¹	21,853,985	5,530	495,870	31,020	2,188,054	1,171,367	119,964	302,341	737,834	16,207,826	594,179
Receipts..... tons ¹	21,853,985	56,836	864,418	137,653	3,913,350	1,646,639	302,704	517,130	917,866	11,487,194	2,010,195
Canned goods:											
Shipments..... tons..	326,007	30	2,038	35	43,438	18,482	238	1,356	147,058	112,119	1,213
Receipts..... tons..	326,007		4,929	272	113,106	95,524		1,583	19,697	83,342	7,554
Cement, brick, and lime:											
Shipments..... tons..	208,358	50	5,552	132	39,911	16,650	8	441	2,015	143,599	
Receipts..... tons..	208,358		24,794	7,500	88,958	20,364	12,939	7,100	4,567	35,608	6,528
Coal:											
Shipments..... tons..	270,649		1,066	65	20,602	77,772	1,601	2,018	2,791	50,427	114,307
Receipts..... tons..	270,649		514	201	90,016	3,504	464	242	95,310	47,005	33,393
Cotton:											
Shipments..... tons..	4,990				3,766			6		50	1,168
Receipts..... tons..	4,990		11		1,173					301	3,505
Flour:											
Shipments..... tons..	298,629	50	39,302	39	52,884	39,191	51,068	20,382	2,921	92,792	
Receipts..... tons..	298,629		4,370		154,975	102	49	34	15,266	89,783	34,050
Fruits and vegetables:											
Shipments..... tons..	481,600	25	7,864	134	42,206	13,888	1,587	2,450	1,600	411,458	388
Receipts..... tons..	481,600		20,399	23,445	144,895	8,836	152,063	2,384	13,733	111,432	4,413
Grain:											
Shipments..... tons..	546,042		34,520	25	49,629	38,727	9,858	14,824	3,680	388,659	6,120
Receipts..... tons..	546,042		15,761		106,024	6,460	42,701	776	14,738	342,951	16,631
Ice:											
Shipments..... tons..	878		105	22	20		147	100		484	
Receipts..... tons..	878		1							877	
Iron ore:											
Shipments..... tons..	10,228									10,228	
Receipts..... tons..	10,228							6,167		18	4,043
Lumber:											
Shipments..... tons..	3,184,785	127	40,106	910	104,546	72,064	466	80,923	5,595	2,841,273	38,775
Receipts..... tons..	3,184,785	80	26,224	672	65,714	45,085	293	50,896	3,479	1,781,021	24,387
Naval stores:											
Shipments..... tons..	16,264				14,644	37		7	12	1,518	46
Receipts..... tons..	16,264				221	178			3	13,750	2,112
Petroleum and other oils:											
Shipments..... tons..	7,699,115	363	126,700	11,730	113,636	283,259	36	87	4,837	7,143,729	14,738
Receipts..... tons..	7,699,115	2,800	767,877	71,090	688,514	1,716,680	216	628	24,319	43,295,324	89,324
Phosphate and fertilizer:											
Shipments..... tons..	33,680		20		1,280	2,491		222	4,507	10,398	14,762
Receipts..... tons..	33,680				18,926	2,836		3,200	71	8,615	32
Pig iron and steel rails:											
Shipments..... tons..	142,776		75		5,541	9,948		1,231	3,033	118,355	4,593
Receipts..... tons..	142,776		6		114,229	355		94	12,404	8,740	6,948
Stone, sand, etc:											
Shipments..... tons..	1,638,685			630	20,915	4,612		16,374	2,123	1,598,358	673
Receipts..... tons..	1,638,685	45,921	322,199		102,947	87,935	15,000	88,064	1,218	975,401	
Tobacco:											
Shipments..... tons..	8,188		28		2,382	149		5,233	275	121	
Receipts..... tons..	8,188				57	220		325	407	500	6,679
Miscellaneous merchandise:											
Shipments..... tons..	6,983,111	4,885	238,494	17,298	1,672,654	594,097	54,955	156,687	557,387	3,289,258	397,896
Receipts..... tons..	6,983,111	2,316	199,280	18,128	1,464,918	246,823	70,855	328,104	554,513	3,561,700	536,474

SHIPMENTS FROM AND DELIVERIES TO PACIFIC PORTS BY VESSELS OF THE ATLANTIC COAST AND GULF OF MEXICO.

Delivered at..... tons..	378,492	4,070	27,754	23,266	304,289	5,754		13,359			
Shipped from..... tons..	177,687		11,384		113,967	12,976		39,360			

¹ All tons of 2,000 pounds.

The fact that the commodities shown for freight shipments and receipts are those selected for a schedule to be used to secure statistics for the country as a whole will explain the appearance in Table 19 of such commodities as cotton, ice, tobacco, etc., which are important in other sections of the country, but insignificant as applied to the Pacific coast.

In accepting the statistics in this table it should be understood that notwithstanding the general willingness on the part of the shipping interest to cooperate with this bureau, there are cases where no record is kept of detailed deliveries that would enable the bureau to prepare an exact statement. In the aggregate, however, it is believed the table presents a fair approximation of the freight movements by Pacific coast

vessels, the total being restricted to the freight carried by vessels operating on the Pacific coast.

Of the commodities specifically named the most important was petroleum and other oils, with 46,656,072 barrels, equivalent to 7,699,115 tons, or 35.2 per cent of the total freight shipments. Next in importance was lumber, with 1,996,750 M feet, the equivalent in tons being 3,184,785, or 14.6 per cent of the total. This figure, however, does not adequately represent the Pacific coast lumber movement by water, as it does not include logs which may have been moved in the shape of rafts. Attempts that have been made to ascertain the amount of logs rafted have been unsuccessful; therefore, for census purposes, logs rafted and towed are not included in the totals.

Stone, sand, etc., is third in rank, to which might be added cement, brick, and lime, commodities that are closely related, inasmuch as they enter into nearly all building operations.

Grain, flour, fruits, and vegetables are the agricultural products of the Pacific coast that enter into the world's commerce. These commodities, taken as a whole, amounted to 1,326,271 tons, or 6.1 per cent of the total freight shipments.

In addition to the movement of freight by the Pacific coast vessels, there were 556,179 tons reported, shipments and deliveries, on vessels from the Atlantic coast and Gulf of Mexico, as shown at the bottom of Table 19.

Table 20 shows for several of the most important Pacific coast ports the total tonnage of freight shipments for 1916 and 1906.

TABLE 20.—FREIGHT SHIPMENTS FROM SELECTED PORTS: 1916 AND 1906.

CITY.	FREIGHT SHIPMENTS (TONS OF 2,000 POUNDS).		PER CENT OF TOTAL FOR CITIES.		PER CENT OF TOTAL FOR PA- CIFIC COAST.	
	1916	1906	1916	1906	1916	1906
Total.....	4,314,146	3,790,649	100.0	100.0	19.7	28.5
San Francisco.....	2,188,054	1,656,614	50.7	43.7	10.0	12.5
Seattle.....	1,171,367	856,988	27.2	22.6	5.4	6.4
Portland.....	495,870	492,573	11.5	13.0	2.3	3.7
Tacoma.....	302,341	270,256	7.0	7.1	1.4	2.0
Stockton.....	119,964	260,195	2.8	6.9	0.5	2.0
Sacramento.....	31,020	254,023	0.7	6.7	0.1	1.9
Los Angeles.....	5,530		0.1		(¹)	

¹ Less than one-tenth of 1 per cent.

In considering the totals in this table it should be understood that certain shipments, like petroleum, lumber, etc., are largely local and from ports that are not recognized of general marine importance. The ports are arranged in the order of their importance. Of the total shipments for the seven cities, San Francisco reported 50.7 per cent in 1916, compared with 43.7 per cent in 1906. Notwithstanding this increased proportion, the port's proportion of the total shipments of the Pacific coast decreased from 12.5 in 1906 to 10 per cent in 1916. Decreases in this respect are shown also for all other cities for which comparative figures are available.

PASSENGERS.

Table 21 shows for ferryboats and for all other classes of vessels combined the number of passengers carried for 1916, 1906, and 1889.

TABLE 21.—NUMBER OF PASSENGERS, WITH PER CENT OF TOTAL AND PER CENT OF INCREASE: 1916, 1906, AND 1889.

CLASS.	NUMBER.			PER CENT OF TOTAL.			PER CENT OF IN- CREASE.	
	1916	1906	1889	1916	1906	1889	1906- 1916	1889- 1916
Total....	55,408,843	44,189,971	15,672,093	100.0	100.0	100.0	25.4	253.6
Ferry.....	48,280,569	39,532,354	14,291,859	87.1	89.5	91.2	22.1	237.8
All other.....	7,128,274	4,657,617	1,380,234	12.9	10.5	8.8	63.0	416.5

There was an increase of 11,218,872, or 25.4 per cent, in the total number of passengers carried in 1916, as compared with 1906. Of this increase, 8,748,215, was shown for ferry passengers, and 2,470,657, for passengers which were classed as "all other," representing increases 22.1 per cent and 53 per cent, respectively, for the ten-year period 1906-1916. Of the total number of passengers carried, 87.1 per cent in 1916 and 89.5 per cent in 1906 were ferry passengers.

IDLE VESSELS.

Table 22 shows the number, gross tonnage, and value of idle steam, sail, and unrigged vessels for 1916 and 1906.

TABLE 22.—IDLE VESSELS: 1916 AND 1906.

CLASS AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Value of vessels.
Total:			
1916.....	561	83,981	\$8,148,479
1906.....	252	28,229	2,062,793
Steam: ¹			
1916.....	368	63,682	5,051,602
1906.....	145	21,994	1,851,731
Sail:			
1916.....	31	6,113	330,350
1906.....	43	1,391	69,935
Unrigged:			
1916.....	162	14,186	766,627
1906.....	64	4,844	141,127

¹ Includes craft propelled by machinery.

In addition to the 4,092 active vessels for which statistics have been presented, reports were received for 561 vessels reported as idle during the entire year 1916. This total includes 109 fishing vessels, 85 of which were gasoline, 6 steam, and 18 sailing vessels, with a total of 2,551 gross tons.

Table 23 shows, in detail, for all vessels, the principal statistics of transportation on the Pacific coast (including Alaska), by class, occupation, and character of ownership, for 1916.

TABLE 23.—ALL VESSELS, BY CLASS,

	CLASS, OCCUPATION, AND OWNERSHIP.	Number of ves- sels.	TONNAGE.		RIGGED.			HORSEPOWER OF ENGINES.	
			Gross.	Net.	Side wheel.	Screw.	Stern wheel.	Steam.	Gasoline.
1	Aggregate.....	4,962	1,215,303	923,863	48	2,767	158	620,579	94,225
2	STEAM AND MOTOR.....	2,973	735,661	479,341	48	2,767	158	620,579	94,225
3	Freight and passenger.....	1,006	611,021	396,325	11	895	99	490,825	29,431
4	Tugs and other towing vessels.....	642	35,600	23,282	.....	593	49	62,394	22,252
5	Ferryboats.....	76	51,480	35,208	35	36	5	42,591	1,783
6	Fishing vessels.....	850	25,301	16,458	.....	845	5	14,711	27,135
7	Yachts.....	293	8,417	5,558	.....	293	.....	8,173	8,641
8	Miscellaneous.....	107	3,842	2,510	2	105	.....	1,885	4,983
9	STEAM.....	798	677,414	438,360	38	613	147	620,579	.....
10	Freight and passenger.....	436	586,346	373,996	7	332	97	490,825	.....
11	Tugs and other towing vessels.....	227	28,372	18,485	.....	182	45	62,394	.....
12	Ferryboats.....	45	49,966	33,991	30	11	4	42,591	.....
13	Fishing vessels.....	72	7,993	4,173	.....	71	1	14,711	.....
14	Yachts.....	11	3,855	2,175	.....	11	.....	8,173	.....
15	Miscellaneous.....	7	852	540	1	6	.....	1,885	.....
16	MOTOR.....	2,175	58,247	40,981	10	2,154	11	.....	94,225
17	Freight and passenger.....	569	24,175	17,329	4	563	2	.....	29,431
18	Tugs and other towing vessels.....	415	4,797	.....	.....	411	4	.....	22,252
19	Ferryboats.....	31	1,494	1,217	5	25	1	.....	1,783
20	Fishing vessels.....	778	17,798	12,285	.....	774	4	.....	27,135
21	Yachts.....	282	4,562	3,383	.....	282	.....	.....	8,641
22	Miscellaneous.....	100	2,990	1,970	1	99	.....	.....	4,983
23	Individual.....	1,295	38,625	26,149	3	1,279	13	19,794	40,512
24	Freight and passenger.....	291	17,145	11,602	1	281	9	9,065	9,776
25	Tugs and other towing vessels.....	190	3,212	2,112	.....	183	2	1,656	7,835
26	Ferryboats.....	11	192	141	1	8	2	30	358
27	Fishing vessels.....	501	9,539	6,633	.....	501	.....	895	13,556
28	Yachts.....	248	7,702	5,056	.....	248	.....	8,023	7,397
29	Miscellaneous.....	54	835	605	1	53	.....	125	1,590
30	Firm.....	262	17,036	11,167	1	255	6	9,427	9,704
31	Freight and passenger.....	70	11,670	7,435	.....	68	2	6,740	2,470
32	Tugs and other towing vessels.....	45	1,313	879	.....	42	3	2,282	1,902
33	Ferryboats.....	5	249	171	.....	4	1	180	65
34	Fishing vessels.....	109	2,882	2,006	.....	109	.....	150	4,286
35	Yachts.....	27	320	224	.....	27	.....	.....	665
36	Miscellaneous.....	6	602	452	1	5	.....	75	316
37	Incorporated company.....	1,384	674,133	438,079	35	1,211	138	584,241	43,113
38	Freight and passenger.....	644	582,206	377,288	10	546	88	475,020	17,185
39	Tugs and other towing vessels.....	397	30,120	19,780	.....	354	43	55,386	12,360
40	Ferryboats.....	49	46,830	31,879	25	22	2	39,934	1,025
41	Fishing vessels.....	240	12,880	7,819	.....	235	5	13,666	9,293
42	Yachts.....	16	345	240	.....	16	.....	150	514
43	Miscellaneous.....	38	1,752	1,073	.....	38	.....	85	2,736
44	All other.....	32	5,867	3,946	9	22	1	7,117	896
45	Freight and passenger.....	10	955	511	.....	9	1	3,070	155
46	Tugs and other towing vessels.....	11	4,209	3,017	9	2	.....	2,447	335
47	Ferryboats.....	2	50	38	.....	2	.....	.....	65
48	Fishing vessels.....	9	653	380	.....	9	.....	1,600	341
49	Yachts.....	.....	.....	.....	.....	.....	.....	.....	.....
50	Miscellaneous.....	.....	.....	.....	.....	.....	.....	.....	.....
51	SAIL.....	316	226,081	204,143	.....	.....	.....	.....	.....
52	Freight and passenger.....	264	220,929	199,466	.....	.....	.....	.....	.....
53	Fishing vessels.....	20	4,041	3,710	.....	.....	.....	.....	.....
54	Yachts.....	29	592	474	.....	.....	.....	.....	.....
55	Miscellaneous.....	3	519	493	.....	.....	.....	.....	.....
56	Individual.....	113	32,452	28,975	.....	.....	.....	.....	.....
57	Freight and passenger.....	77	31,173	27,848	.....	.....	.....	.....	.....
58	Fishing vessels.....	8	704	670	.....	.....	.....	.....	.....
59	Yachts.....	28	575	457	.....	.....	.....	.....	.....
60	Miscellaneous.....	.....	.....	.....	.....	.....	.....	.....	.....
61	Firm.....	26	8,508	7,655	.....	.....	.....	.....	.....
62	Freight and passenger.....	24	8,477	7,624	.....	.....	.....	.....	.....
63	Fishing vessels.....	1	14	14	.....	.....	.....	.....	.....
64	Yachts.....	1	17	17	.....	.....	.....	.....	.....
65	Miscellaneous.....	.....	.....	.....	.....	.....	.....	.....	.....
66	Incorporated company.....	166	178,109	161,239	.....	.....	.....	.....	.....
67	Freight and passenger.....	152	174,267	157,720	.....	.....	.....	.....	.....
68	Fishing vessels.....	11	3,323	3,026	.....	.....	.....	.....	.....
69	Yachts.....	.....	.....	.....	.....	.....	.....	.....	.....
70	Miscellaneous.....	3	519	493	.....	.....	.....	.....	.....
71	All other.....	11	7,012	6,274	.....	.....	.....	.....	.....
72	Freight and passenger.....	11	7,012	6,274	.....	.....	.....	.....	.....
73	Fishing vessels.....	.....	.....	.....	.....	.....	.....	.....	.....
74	Yachts.....	.....	.....	.....	.....	.....	.....	.....	.....
75	Miscellaneous.....	.....	.....	.....	.....	.....	.....	.....	.....
76	UNRIGGED.....	1,673	253,561	240,379	.....	.....	.....	.....	.....
77	Individual.....	170	11,792	11,431	.....	.....	.....	.....	.....
78	Firm.....	129	7,953	7,606	.....	.....	.....	.....	.....
79	Incorporated company.....	1,354	229,551	217,290	.....	.....	.....	.....	.....
80	All other.....	20	4,265	4,052	.....	.....	.....	.....	.....

¹ Includes statistics for 870 fishing vessels, a class not reported at prior censuses.

OCCUPATION, AND OWNERSHIP: 1916.¹

CONSTRUCTION.			Value of ves- sels.	INCOME.			Number employed on vessels.	Wages.	Number of passengers carried.	FREIGHT CARRIED (TONS OF 2,000 POUNDS).		
Metal.	Wood.	Com- posite.		Freight.	Passengers.	All other.				Exclusive of lighterage.	Lighterage or harbor work.	
257	4,701	4	\$132,524,924	\$56,574,455	\$11,671,699	\$16,884,030	28,466	\$20,483,963	55,408,881	21,856,134	3,271,499	1
201	2,769	3	111,042,115	46,159,841	11,571,699	13,595,063	22,978	17,445,363	55,408,881	15,362,726	169,172	2
146	857	2	89,404,958	45,918,718	9,312,452	2,035,378	14,759	11,737,724	7,105,624	15,339,376	152,634	3
21	621	1	6,866,384	228,858	40,996	5,749,930	2,412	2,116,600	18,943	21,744	16,538	4
9	66	1	6,007,936	10,758	2,216,001	1,043,555	825	904,080	48,280,569	1,399	16,538	5
15	835	1	6,054,415	1,507	283	4,460,381	4,478	2,212,981	88	207	16,538	6
7	286	1	2,139,937	1,967	283	47,951	204	202,557	3,707	207	16,538	7
3	104	1	968,432	1,507	1,967	257,808	240	211,421	3,707	207	16,538	8
186	609	3	99,668,156	44,085,423	11,056,024	8,445,195	16,575	13,811,560	52,799,205	14,408,240	73,893	9
133	301	2	85,621,453	43,917,353	8,970,680	1,835,213	13,294	10,715,597	6,032,609	14,399,409	57,355	10
20	207	1	5,039,359	168,075	89	4,308,709	1,698	1,571,022	92	14,771	16,538	11
9	35	1	6,394,550	2,085,255	2,085,255	1,018,581	755	912,615	46,766,504	1,399	16,538	12
15	57	1	1,107,600	1,507	1,967	1,212,872	601	409,208	3,707	207	16,538	13
6	5	1	1,187,000	1,507	1,967	45,750	160	121,902	3,707	207	16,538	14
3	4	1	318,194	1,507	1,967	24,070	67	81,156	3,707	207	16,538	15
15	2,160	1	11,373,959	2,074,413	515,675	5,149,868	6,403	3,633,803	2,609,676	954,486	95,279	16
13	556	1	3,783,505	2,001,365	341,772	300,165	1,465	1,022,127	1,073,015	945,907	95,279	17
1	414	1	1,827,025	60,783	40,907	1,441,221	714	545,578	18,851	6,973	95,279	18
1	31	1	213,386	10,758	130,746	24,974	70	61,465	1,514,065	1,399	95,279	19
1	778	1	3,946,818	1,507	1,967	3,247,509	3,877	1,803,773	38	1,399	95,279	20
1	281	1	952,937	1,507	1,967	2,201	104	80,595	3,707	207	95,279	21
1	100	1	650,288	1,507	1,967	233,798	173	130,265	3,707	207	95,279	22
8	1,287	1	6,863,293	1,801,170	303,666	2,588,607	3,746	2,137,074	947,617	730,472	4,653	23
1	290	1	2,564,162	1,751,955	233,514	120,558	949	672,192	675,521	726,739	4,653	24
1	190	1	648,730	45,590	38,810	624,832	325	258,141	6,928	2,592	4,653	25
1	11	1	28,600	2,118	29,142	6,137	12	11,495	261,423	934	4,653	26
1	501	1	1,460,476	1,507	1,967	1,723,347	2,179	993,510	33	207	4,653	27
1	241	1	2,014,725	1,507	1,967	46,429	249	189,577	3,707	207	4,653	28
1	54	1	146,600	1,507	1,967	68,304	32	12,159	3,707	207	4,653	29
3	259	1	2,596,305	1,429,671	61,814	813,600	1,130	846,207	295,368	408,091	2,500	30
2	68	1	1,772,480	1,409,268	53,508	23,370	383	414,910	124,500	404,737	2,500	31
1	45	1	230,200	11,763	8,256	232,174	133	90,984	170,863	2,889	2,500	32
1	5	1	30,100	8,640	50	3,801	12	6,237	6	465	2,500	33
1	109	1	458,175	8,640	50	513,107	578	317,559	6	465	2,500	34
1	27	1	53,850	1,507	1,967	1,080	1	1,080	3,707	207	2,500	35
1	5	1	51,500	1,507	1,967	41,148	23	15,437	3,707	207	2,500	36
185	1,197	2	100,547,990	42,923,000	11,143,950	10,032,160	17,871	14,198,506	51,566,805	14,224,163	162,019	37
143	499	2	85,068,316	42,757,495	9,025,430	1,891,450	18,427	10,650,622	6,305,603	14,207,900	146,481	38
19	378	2	5,693,936	171,505	2,186	4,773,099	1,892	1,707,731	12,015	16,263	16,538	39
8	41	2	6,147,599	2,116,334	2,116,334	1,007,258	695	834,136	45,249,187	1,399	16,538	40
15	225	2	3,135,767	1,507	1,967	2,223,927	1,721	901,912	11,900	42	16,538	41
1	16	2	66,862	1,507	1,967	1,522	14	11,900	42	42	16,538	42
1	38	2	435,510	1,507	1,967	134,904	122	92,205	42	42	16,538	43
5	26	1	1,034,527	62,269	62,269	160,696	231	263,576	2,599,091	2,599,091	2,500	44
2	8	1	293,518	62,269	62,269	119,825	62	59,744	2,599,091	2,599,091	2,500	45
1	9	1	401,637	62,269	62,269	27,359	106	112,212	2,599,091	2,599,091	2,500	46
2	2	1	4,500	62,269	62,269	13,512	63	91,620	2,599,091	2,599,091	2,500	47
2	7	1	334,872	62,269	62,269	13,512	63	91,620	2,599,091	2,599,091	2,500	48
34	281	1	13,419,521	7,727,579	681,850	681,850	3,974	1,904,049	1,749,031	1,749,031	1,749,031	51
34	230	1	13,169,036	7,725,329	339,031	339,031	3,550	1,674,058	1,748,281	1,748,281	1,748,281	52
20	20	1	159,860	2,250	341,319	341,319	412	215,841	750	750	750	53
28	3	1	71,125	1,500	1,500	1,500	6	6,125	8,025	8,025	8,025	54
3	3	1	19,500	1,500	1,500	1,500	6	8,025	8,025	8,025	8,025	55
2	110	1	1,783,725	1,201,789	91,167	91,167	635	350,974	225,867	225,867	225,867	56
2	75	1	1,683,900	1,201,789	9,417	9,417	543	309,095	225,867	225,867	225,867	57
1	8	1	30,200	81,750	81,750	81,750	86	35,754	6,125	6,125	6,125	58
1	27	1	69,625	81,750	81,750	81,750	6	6,125	6,125	6,125	6,125	59
26	26	1	390,000	379,915	379,915	379,915	157	107,656	61,157	61,157	61,157	60
24	24	1	387,000	379,915	379,915	379,915	157	107,656	61,157	61,157	61,157	61
1	1	1	1,500	379,915	379,915	379,915	157	107,656	61,157	61,157	61,157	62
1	1	1	1,500	379,915	379,915	379,915	157	107,656	61,157	61,157	61,157	63
32	134	1	10,875,796	5,818,311	587,933	587,933	3,076	1,370,555	1,432,797	1,432,797	1,432,797	64
32	120	1	10,728,136	5,816,061	329,164	329,164	2,744	1,182,443	1,432,047	1,432,047	1,432,047	65
11	11	1	128,160	2,250	257,269	257,269	326	180,037	750	750	750	66
3	3	1	19,500	1,500	1,500	1,500	6	8,025	8,025	8,025	8,025	67
11	11	1	370,000	327,564	327,564	327,564	106	74,864	29,210	29,210	29,210	68
11	11	1	370,000	327,564	327,564	327,564	106	74,864	29,210	29,210	29,210	69
22	1,651	1	8,063,288	2,687,035	2,607,117	2,607,117	1,514	1,134,551	4,744,377	4,744,377	4,744,377	70
170	170	1	256,810	106,654	48,809	48,809	77	50,648	368,048	368,048	368,048	71
129	129	1	485,760	15,124	91,770	91,770	72	29,979	154,468	154,468	154,468	72
2	1,334	1	6,379,169	2,561,408	2,174,826	2,174,826	1,158	896,875	4,163,490	4,163,490	4,163,490	73
2	18	1	941,549	3,849	291,712	291,712	207	167,049	68,371	68,371	68,371	74

GREAT LAKES
AND ST. LAWRENCE RIVER

GREAT LAKES AND ST. LAWRENCE RIVER.

By FRANCIS N. STACY.

SCOPE OF THE REPORT.

The statistics of water transportation presented in this section are for the year ending December 31, 1916, and relate to the American vessels, ports, and commerce of the great chain of inland fresh-water seas which comprise Lake Superior and its outlet, the Sault Ste. Marie Canals and St. Mary's River; Lake Michigan and the Straits of Mackinac; Lakes Huron and St. Clair, and their respective outlets, the St. Clair and Detroit Rivers; Lakes Erie and Ontario; and the St. Lawrence River, the final outlet, which carries the waters of the Great Lakes watershed to the Atlantic Ocean.

The Great Lakes and connecting waterways have been recognized for many years as one of the most important units of water transportation in the United States. In number, type, and cargo capacity of steam freight-carrying vessels, in volume and density of water-borne traffic, in tonnage of bulk freight handled, and low cost of freight transportation, and, above all, in economic power effective in developing a vast productive territory and delivering its products and raw materials to manufacturing industries and to domestic and foreign commerce, the Great Lakes and St. Lawrence River rank as one of the Nation's foremost systems of water transportation.

In type of vessel construction, as well as in dock facilities and freight-handling machinery adapted to speedy, efficient, and economical delivery of freight commodities, the Great Lakes equipment is admittedly one of the most complete and up to date known to transportation and commerce.

The report covers all American-owned craft of 5 tons net register or over operating on the Great Lakes and the St. Lawrence River, except vessels owned by the Federal Government. At the census of 1906 fishing vessels were not included in the statistics; therefore, they can not be shown in this report in tables giving comparative data.

Data compiled by the Bureau of Navigation which is introduced in this report do not agree with those collected by the Census Bureau. The discrepancies are due to a difference in the period covered—between the calendar year and the year ending June 30—and to the fact that only documented craft are considered by the navigation authorities, while the Census Bureau considers all American-owned craft of 5 tons net register or over.

GENERAL SUMMARY.

The more important statistics relating to water transportation on the Great Lakes are summarized in Table 1, by class of vessels, for 1916, 1906, and 1889.

TABLE 1.—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916, 1906, AND 1889.

	TOTAL.						STEAM. ¹					
	1916	1906	1889	Per cent of increase. ²			1916	1906	1889	Per cent of increase. ²		
				1889-1916	1906-1916	1889-1906				1889-1916	1906-1916	1889-1906
Number of vessels.....	2,856	2,990	2,737	4.3	-4.5	9.2	1,837	1,676	1,467	25.2	9.6	14.2
Gross tonnage.....	2,737,491	2,392,863	920,294	197.5	14.4	160.0	2,410,430	1,915,786	595,813	304.6	25.8	221.5
Value of vessels.....	\$174,765,526	\$130,805,640	\$48,580,174	259.7	33.6	169.3	\$162,256,355	\$116,983,812	\$40,868,824	297.0	38.7	186.2
Gross income ³	\$85,095,887	\$65,274,702	\$35,463,852	140.0	30.4	84.1	\$79,506,305	\$56,340,227	\$24,949,267	215.7	41.1	125.8
Number employed on vessels.....	26,873	24,916	22,726	18.2	7.9	9.6	24,163	20,515	15,271	58.2	17.8	34.3
Wages.....	\$18,633,219	\$13,280,716	\$8,098,191	130.1	40.3	64.0	\$17,027,341	\$11,179,882	\$5,796,895	193.7	52.3	92.9
Number of passengers carried.....	19,231,681	14,080,146	2,235,993	760.1	36.6	529.7	19,231,681	14,080,146	2,235,993	760.1	36.6	529.7
Freight and harbor work (net tons).....	131,472,088	475,609,649	25,266,974	420.3	73.9	199.2	125,567,892	(⁶)	(⁶)	.....	.....	.....
Freight carried.....	125,384,042	475,609,649	25,266,974	396.2	66.8	199.2	122,440,705	(⁶)	(⁶)	.....	.....	.....
Harbor work.....	6,088,046	(⁶)	(⁶)	.....	.....	.....	3,227,187	(⁶)	(⁶)	.....	.....	.....
	SAIL. ⁴						UNRIGGED.					
	1916	1906	1889	Per cent of increase. ²			1916	1906	1889	Per cent of increase. ²		
				1889-1916	1906-1916	1889-1906				1889-1916	1906-1916	1889-1906
Number of vessels.....	162	531	962	-83.2	-69.5	-44.8	857	783	308	178.2	9.5	154.2
Gross tonnage.....	145,450	265,571	185,081	-21.4	-45.2	43.5	181,611	211,506	139,400	30.3	-14.1	51.7
Value of vessels.....	\$4,351,287	\$7,135,271	\$4,238,850	2.7	-39.0	68.3	\$8,157,884	\$6,686,557	\$3,472,500	134.9	22.0	92.6
Gross income ³	\$1,611,810	\$4,341,174	\$8,240,645	-80.4	-62.9	-47.3	\$3,978,772	\$4,593,301	\$2,273,940	75.0	-13.4	102.0
Number employed on vessels.....	878	2,258	5,758	-84.8	-61.1	-60.8	1,832	2,143	1,697	8.0	-14.5	26.3
Wages.....	\$464,581	\$962,542	\$1,804,003	-74.2	-51.7	-46.6	\$1,141,297	\$1,138,292	\$497,293	129.5	0.3	128.9
Number of passengers carried.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Freight and harbor work (net tons).....	1,764,690	(⁶)	(⁶)	.....	.....	.....	4,039,506	(⁶)	(⁶)	.....	.....	.....
Freight carried.....	1,730,990	(⁶)	(⁶)	.....	.....	.....	1,212,347	(⁶)	(⁶)	.....	.....	.....
Harbor work.....	33,700	(⁶)	(⁶)	.....	.....	.....	2,827,159	(⁶)	(⁶)	.....	.....	.....

¹ Includes craft propelled by machinery.

² A minus sign (-) denotes decrease.

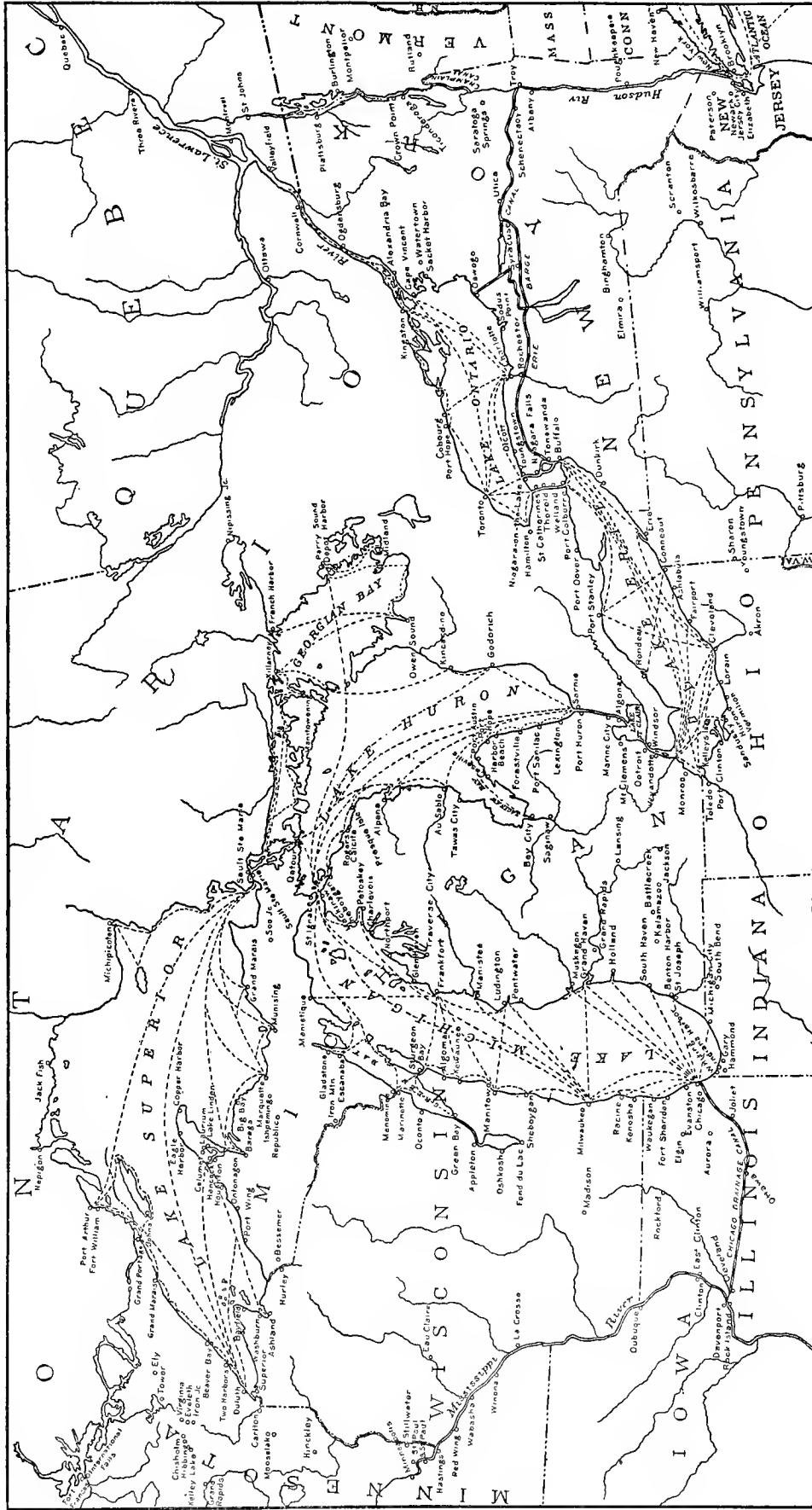
³ In a number of cases the income for unriggered craft was credited to the towing steamers.

⁴ Includes 2,003,453 tons of bunker coal reported by the Bureau of Statistics of the Department of Commerce and Labor, 1906.

⁵ Figures not available.

⁶ Includes schooner barges, etc.

GREAT LAKES TRANSPORTATION ROUTES.



The map on page 138 of the Great Lakes region, copied from Rand McNally and Co.'s Commercial Atlas, is introduced showing the ports and lines of traffic.

The figures in Table 1 indicate an extraordinary increase in Great Lakes shipping during the period from 1889 to 1916; they reflect not only the vastly increased capacity and efficiency of the Great Lakes merchant fleet, but the rapidly expanding resources and industrial production of the Great Lakes region, as well as the growing volume of interstate commerce, which are alike cause and effect of the transportation growth here presented. Although the number of vessels decreased in 1916 as compared with 1906, the gross tonnage of vessels increased 14.4 per cent. The tonnage of freight carried shows an increase in 1916 over that carried in 1906 of nearly 50,000,000 net tons, or 65.8 per cent, while difference between the number of passengers carried in 1916 and in 1906 amounted to more than 5,000,000, or an increase of 36.6 per cent. The increase in gross income amounted to nearly \$20,000,000, or 30.4 per cent. The statistics shown in the table for steam vessels illustrate the substantial increase in transportation by this class of vessel, while those for sailing vessels show heavy decreases. For unrigged craft the number and value show an increase, but the tonnage and gross income of these craft decreased.

A comparison of the principal data for water transportation for the United States and for the Great Lakes and St. Lawrence River, for 1916 and 1906, with the percentage that the Great Lakes shipping formed of the total in each year, is shown in Table 2.

TABLE 2.—WATER TRANSPORTATION, UNITED STATES AND THE GREAT LAKES AND ST. LAWRENCE RIVER: 1916 AND 1906.

	UNITED STATES.		GREAT LAKES AND ST. LAWRENCE RIVER.		PER CENT GREAT LAKES IS OF THE UNITED STATES.	
	1916	1906	1916	1906	1916	1906
Number of vessels...	37,894	37,321	2,856	2,990	7.5	8.0
Gross tonnage.....	12,249,990	12,893,429	2,737,491	2,392,863	22.3	18.6
Value of vessels.....	\$959,925,364	\$507,973,121	\$174,765,526	\$130,805,640	18.2	25.8
Gross income.....	\$563,736,367	\$294,854,532	\$85,095,387	\$65,274,702	15.1	22.1
From freight.....	\$422,773,417	\$175,545,361	\$70,377,339	\$52,076,533	16.6	29.7
From passengers.....	\$32,958,670	\$43,645,365	\$6,879,005	\$4,866,904	13.0	11.2
From all other sources.....	\$88,004,280	\$75,663,806	\$7,839,543	\$8,331,265	8.9	11.0
Number employed on vessels.....	153,301	140,929	26,873	24,916	17.5	17.7
Wages.....	\$103,235,534	\$71,636,521	\$18,633,219	\$13,280,716	18.0	18.5
Number of passengers carried.....	331,590,565	366,825,663	19,231,681	14,080,146	5.8	3.8
Freight and harbor work (tonsof 2,000 pounds).....	381,352,926	265,545,804	131,472,088	175,609,649	34.5	28.5
Freight carried.....	258,002,611	177,519,758	125,384,042	175,609,649	48.6	42.6
Harbor work....	123,350,315	88,026,046	6,088,046	(²)	4.9	-----

¹ Bureau of Statistics, Department of Commerce and Labor, Monthly Summary, Internal Commerce of the United States, December, 1906, and includes 2,003,453 tons of bunker coal.

² Not reported.

In the two most important items of transportation development, vessel tonnage and volume of freight handled, the Great Lakes in 1916 show marked increases in the proportions contributed to the totals.

Gross vessel tonnage for the Great Lakes and St. Lawrence River increased from 18.6 per cent of the total for the United States in 1906 to 22.3 per cent in 1916. It is in volume of freight handled, however, that the Great Lakes fleet makes its chief record for capacity and efficiency. This fleet handled 48.6 per cent of the water-borne freight shipments reported for the United States as a whole in 1916, or nearly one-half of the country's total; the comparative percentage in 1906 was 42.6 per cent.

The efficiency and economy of the Great Lakes fleet as a public carrier is marked by notably low and reasonable transportation rates. As a result, though the fleet in 1916 represented 22.3 per cent of the country's total vessel tonnage and handled 48.6 per cent of the water-borne freight shipments, it earned only 16.6 per cent of the gross income from freight. The comparatively high seaboard rates prevailing in 1916, with notably economical Great Lakes rates, are largely responsible for the proportion of gross income assignable to the Great Lakes decreasing from 22.1 per cent in 1906 to 15.1 per cent in 1916.

Undocumented craft.—Undocumented craft consist principally of yachts, harbor craft, canal boats, and barges operating on the rivers and other inland waters, and as these are not required to be documented the only official record for them, probably, is the census reports. The number of such vessels, both active and idle, reported to the Census Bureau as operating on the Great Lakes, with their tonnage, are shown, for 1916 and 1906, in Table 3.

TABLE 3.—NUMBER AND GROSS TONNAGE OF ACTIVE AND IDLE UNDOCUMENTED CRAFT: 1916 AND 1906.

CLASS.	NUMBER OF VESSELS.		GROSS TONNAGE.	
	1916	1906	1916	1906
Total.....	794	775	80,283	159,351
Active.....	704	748	70,347	150,363
Steam ¹	320	124	3,274	5,984
Sail.....	28	49	263	408
Unrigged.....	356	575	66,810	143,971
Idle.....	90	27	9,936	8,988
Steam ¹	38	3	502	104
Sail.....	1	2	7	260
Unrigged.....	51	22	9,427	8,624

¹ Includes craft propelled by machinery.

Steam, sail, and unrigged craft.—In accordance with the tendency exhibited along the Atlantic coast, the importance of steam vessels as a class is increasing in the transportation on the Great Lakes, while the sailing vessel class is decreasing in importance. Unrigged craft are being increasingly used for transportation purposes, and in many instances are of larger average capacity. Table 4 gives the number, gross tonnage, and value of vessels on the Great Lakes, classified according to propulsion, for 1916, 1906, and 1889. Average tonnage per vessel and average value per ton are also shown in the table.

TABLE 4.—NUMBER, GROSS TONNAGE, AND VALUE OF DIFFERENT CLASSES OF VESSELS: 1916, 1906, AND 1889.

CLASS AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Value of vessels.	Average tonnage per vessel.	Average value per ton.
Total:					
1916.....	2,856	2,737,491	\$174,765,526	959	\$64
1906.....	2,990	2,392,863	130,805,640	800	55
1889.....	2,737	920,294	48,580,174	336	53
Steam:¹					
1916.....	1,837	2,410,430	162,256,355	1,312	67
1906.....	1,676	1,915,786	116,983,812	1,143	61
1889.....	1,467	595,813	40,868,824	406	69
Sail:					
1916.....	162	145,450	4,351,287	898	30
1906.....	531	265,571	7,135,271	500	27
1889.....	962	185,081	4,238,850	192	23
Unrigged:					
1916.....	857	181,611	8,157,884	212	45
1906.....	783	211,506	6,686,557	270	32
1889.....	308	139,400	3,472,500	453	25

¹ Includes craft propelled by machinery.

DIAGRAM 1.—GROSS TONNAGE OF ALL VESSELS, BY CLASSES: 1916, 1906, AND 1889.

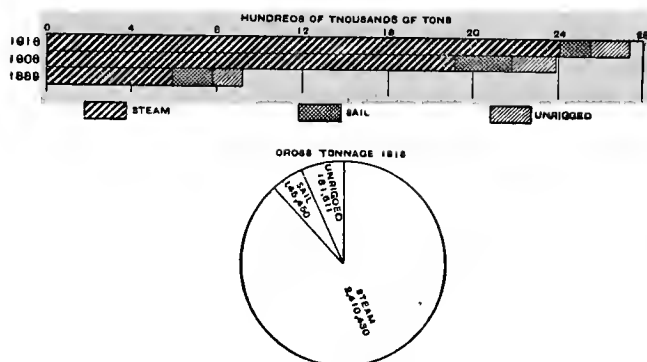
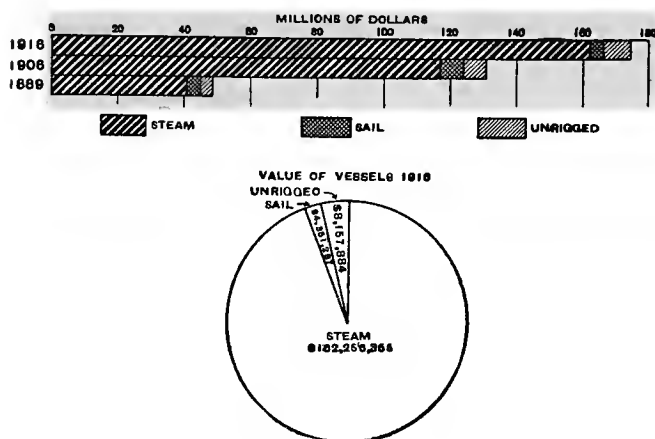


DIAGRAM 2.—VALUE OF ALL VESSELS, BY CLASSES: 1916, 1906, AND 1889.



The figures in Table 4 show the steady increase in the number and gross tonnage of steam vessels for the three census periods, and illustrate the trend of Great Lakes transportation development toward greater size and tonnage. The average tonnage of steam vessels advanced from 406 tons in 1889 to 1,143 in 1906 and 1,312 in 1916. The value of the steam vessels increased from \$40,868,824 in 1889 to \$116,983,812 in 1906 and to \$162,256,355 in 1916; the average value per ton increased from \$61 in 1906 to

\$67 in 1916. The value of the steam vessels formed 92.8 per cent of the total value of all lake carriers in 1916. The number of sail vessels decreased from 531 in 1906 to 162 in 1916, or 69.5 per cent, while the gross tonnage and the value decreased 45.2 per cent and 39 per cent, respectively. Unrigged craft, although increasing in number, decreased in total gross tonnage, the average tonnage decreasing from 270 to 212 per vessel.

The Bureau of Navigation compiles, annually, statistics similar to those given in Table 4, and these are shown for each five-year period from 1870 to 1916 in Table 5.

TABLE 5.—NUMBER AND GROSS TONNAGE OF DIFFERENT CLASSES OF VESSELS, WITH AVERAGE TONNAGE PER VESSEL: 1870 TO 1916.¹

YEAR.	STEAM. ²			SAIL.			UNRIGGED.		
	Number of vessels.	Gross tonnage.	Average tonnage per vessel.	Number of vessels.	Gross tonnage.	Average tonnage per vessel.	Number of vessels.	Gross tonnage.	Average tonnage per vessel.
1916.....	2,319	2,441,368	1,053	190	182,117	959	402	120,912	301
1911.....	2,152	2,560,205	1,190	320	228,209	713	354	104,702	296
1906.....	1,824	1,838,136	1,008	511	268,585	526	230	75,914	330
1900.....	1,719	1,106,842	644	813	333,906	411	233	82,109	352
1895.....	1,737	854,018	492	1,066	298,297	280	157	48,649	310
1890.....	1,507	648,725	430	1,236	326,077	264	174	29,301	168
1885.....	1,154	332,365	288	1,282	310,383	242	198	41,876	211
1880.....	912	209,465	230	1,415	302,264	214	202	45,766	227
1875.....	869	197,073	227	1,645	335,822	204	2,075	238,740	115
1870.....	625	136,980	219	1,545	254,819	165	2,384	237,287	100

¹ Reports of the Commissioner of Navigation, 1885 and subsequent years, and "Commerce and Navigation of the United States," Treasury Department, 1880 and preceding years.² Includes craft propelled by machinery.

The figures shown in Table 5 are not comparable with those tabulated in Table 4, as explained in the introduction to this section of the report; however, they furnish an excellent basis for tracing the growth of, and changes in, lake tonnage during the past half century.

The great growth and development in the steam tonnage of the Great Lakes is illustrated by the remarkable increase in gross tonnage, from 136,980 tons in 1870 to 1,106,842 in 1900, and by the further advance to 2,441,368 gross tons in 1916. The slight decline in tonnage in 1916 is due to the transfer of vessels from the Great Lakes to the seaboard to meet war demands, but from 1911 until 1914, when the war began, the steam tonnage on the Great Lakes, as shown by the Bureau of Navigation, represented practically 50 per cent of the steam tonnage enrolled and registered for the United States.

CONSTRUCTION.

The transition of vessel propulsion from sail to steam has been accompanied by a change in construction from wood to metal. It is an interesting fact in connection with construction of vessels that all the metal vessels built in 1916 were steel vessels. The

number, gross tonnage, and value of vessels engaged in Great Lakes commerce, by character of construction, for 1916, 1906, and 1889, are shown in Table 6.

TABLE 6.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.

CHARACTER OF CONSTRUCTION AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Value of vessels.	Average tonnage per vessel.	Average value per ton.
Total:					
1916.....	2,856	2,737,491	\$174,765,526	959	\$64
1906.....	2,990	2,392,893	130,805,640	800	55
1889.....	2,737	920,294	48,580,174	336	53
Metal:					
1916.....	832	2,353,777	155,231,482	2,829	66
1906.....	572	1,634,153	105,729,416	2,856	64
1889.....	85	111,410	10,574,224	1,311	95
Wood:					
1916.....	1,993	341,603	15,550,105	171	46
1906.....	2,391	737,386	24,075,474	308	33
1889.....	2,641	794,128	36,777,950	301	46
Composite:					
1916.....	31	42,111	3,983,939	1,358	95
1906.....	27	21,324	1,000,750	790	47
1889.....	11	14,756	1,228,000	1,341	83

DIAGRAM 3.—GROSS TONNAGE OF ALL VESSELS, BY CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.

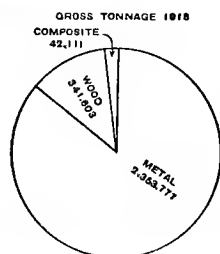
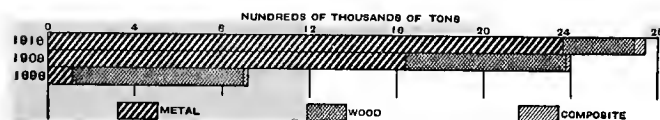


DIAGRAM 4.—VALUE OF ALL VESSELS, BY CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.

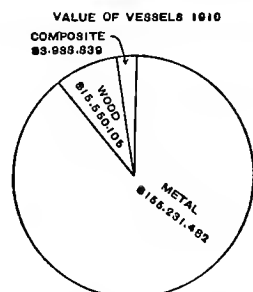
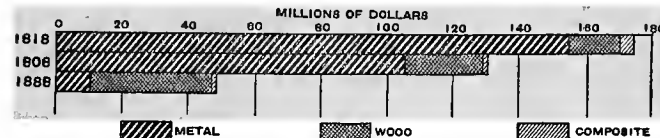


Table 6 shows that in 1889, except for a negligible number, all the vessels on the Great Lakes were constructed of wood, and while in 1916 the greatest

number was wood, the proportion had decreased from 96.5 per cent, as shown for 1889, to 69.8 per cent. The average tonnage of wooden vessels decreased from 301 gross tons in 1889 to 171 tons in 1916. Metal vessels which numbered only 85 in the Great Lakes traffic in 1889 numbered 832 in 1916, an increase of 878.8 per cent. The tonnage of this class of vessels increased from 10,574,224 gross tons in 1889 to 155,231,482 in 1916, or nearly fifteen fold, the average tonnage increasing from 1,311 in 1889 to 2,829 in 1916.

Table 7 shows data, as compiled by the Commissioner of Navigation, similar to those shown in Table 6, but for more extended period.

TABLE 7.—NUMBER AND GROSS TONNAGE OF METAL AND WOODEN VESSELS, WITH AVERAGE TONNAGE PER VESSEL: 1875 TO 1916.¹

YEAR.	METAL.			WOODEN.		
	Number of vessels.	Gross tonnage.	Average tonnage per vessel.	Number of vessels.	Gross tonnage.	Average tonnage per vessel.
1916.....	844	2,375,297	2,814	2,067	369,100	179
1911.....	799	2,360,323	2,954	2,027	532,793	263
1906.....	513	1,526,506	2,811	2,022	656,129	324
1900.....	318	686,675	2,159	2,447	838,182	342
1895.....	190	300,648	1,582	2,770	900,316	325
1890.....	88	127,926	1,454	2,829	376,177	310
1885.....	34	34,028	1,001	2,606	650,596	250
1880.....	18	15,973	887	2,511	641,522	216
1875.....	16	15,585	974	4,573	756,050	165

¹ Reports of the Commissioner of Navigation, 1885 and subsequent years, and "Commerce and Navigation of the United States," Treasury Department, 1875 and 1880.

In 1875 metal construction of documented lake vessels had made a modest beginning of 15,585 gross tonnage. By 1900 metal tonnage on the Lakes had grown to 686,675 tons, thence increasing to 2,375,297 tons in 1916, or 245.9 per cent. Construction of wooden vessels, meanwhile, declined until the average size of such boats was only 179 tons in 1916, and the craft were mainly sailboats, ferries, fishing boats, launches, and lighterage barges.

Table 8 shows gross and net tonnage of all vessels on the Great Lakes, with their value and the horsepower of engines, classified according to construction and method of propulsion, for 1916 and 1906.

There were 690 steam and motor vessels of metal construction operating on the Great Lakes in 1916, with a gross tonnage of 2,210,779, valued at \$148,344,980, as compared with 489 steam and motor vessels of 1,489,481 gross tonnage, valued at \$99,405,123, in 1906.

The figures show a growth of approximately 50 per cent in both tonnage and value of the metal fleet of steam vessels on the Lakes from 1906 to 1916. As the increase in the gross tonnage of all steam and motor vessels amounted to 25.8 per cent, the increase of 50 per cent for metal vessels illustrates the greater importance of these vessels. The horsepower of engines used for the metal steam and motor craft increased 34.7 per cent from 1906 to 1916.

TABLE 8.—NUMBER OF VESSELS, TONNAGE, HORSEPOWER OF ENGINES, AND VALUE, BY CHARACTER OF CONSTRUCTION AND CLASS: 1916 AND 1906.

CHARACTER OF CONSTRUCTION AND CLASS.	NUMBER OF VESSELS.		TONNAGE.				HORSEPOWER.		VALUE OF VESSELS.	
			Gross.		Net.					
	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906
Total.....	2, 856	2, 990	2, 737, 491	2, 392, 863	2, 111, 205	1, 905, 176	1, 066, 169	982, 555	\$174,765,526	\$130,805,640
Metal.....	832	572	2, 353, 777	1, 634, 153	1, 796, 159	1, 259, 307	861, 996	640, 011	155, 231, 482	105, 729, 416
Steam.....	672	1 489	2, 209, 888	1 1, 489, 481	1, 660, 671	1, 124, 736	859, 691	1 640, 011	148, 102, 330	1 99, 405, 123
Motor.....	18	.....	911	.....	720	.....	2, 305	.....	242, 650	.....
Sail.....	7	4	23, 413	4, 410	21, 359	3, 984	.....	.....	961, 978	251, 300
Unrigged.....	117	48	57, 488	33, 287	54, 327	31, 030	.....	.....	3, 544, 511	1, 691, 534
Schooner barges.....	18	31	62, 097	106, 975	59, 082	99, 557	.....	.....	2, 380, 013	4, 381, 459
Wood.....	1, 993	2, 391	341, 603	737, 386	287, 710	628, 750	161, 399	334, 092	15, 550, 105	24, 075, 474
Steam.....	457	1, 172	148, 833	410, 104	110, 277	315, 469	133, 940	1 334, 092	7, 777, 412	1 16, 677, 489
Motor.....	664	.....	11, 157	8, 820	8, 820	.....	27, 459	.....	2, 300, 024	.....
Sail.....	96	408	30, 770	101, 136	29, 334	95, 888	.....	.....	579, 989	1, 607, 787
Unrigged.....	735	725	121, 673	173, 119	111, 967	167, 308	.....	.....	4, 463, 373	4, 897, 773
Schooner barges.....	41	86	29, 170	53, 027	27, 312	50, 085	.....	.....	429, 307	892, 425
Composite.....	31	27	42, 111	21, 324	27, 336	17, 119	42, 774	8, 452	3, 983, 939	1, 000, 750
Steam.....	24	1 15	39, 626	1 16, 201	25, 409	1 12, 023	42, 739	1 8, 452	3, 827, 939	1 901, 200
Motor.....	2	.....	35	.....	32	.....	35	.....	6, 000	.....
Sail.....	.....	2	.....	23	.....	21	.....	.....	.....	2, 300
Unrigged.....	5	10	2, 450	5, 100	1, 895	5, 075	.....	.....	150, 000	97, 250
Schooner barges.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

¹ Includes craft propelled by machinery.

TONNAGE OF VESSELS.

The report of the Commissioner of Navigation for 1916 presents the geographic distribution of steam vessels of 5,000 gross tons and over, as follows: Great Lakes, 173 vessels of 1,119,690 gross tons; Atlantic and Gulf coasts, 133 vessels of 890,000 tons; and Pacific coast, 26 vessels of 172,305 tons. According to this, Great Lakes commerce in 1916 employed a larger number of vessels of 5,000 gross tons or over and a greater tonnage than the Atlantic, Gulf, and Pacific coasts

combined. These reports also show that the first lake steam vessels of 5,000 tons appeared in 1901, when 15 were documented, with an aggregate of 79,157 gross tonnage. In 1906 there were 63 of these vessels, with a tonnage of 386,427, and in 1916 they numbered 173, with 1,119,690 aggregate gross tonnage. Table 9 shows, as reported to the Census Bureau, the number and gross tonnage of steam, motor, sail, and unrigged vessels, classified according to tonnage, for 1916.

TABLE 9.—ALL VESSELS GROUPED ACCORDING TO GROSS TONNAGE: 1916.

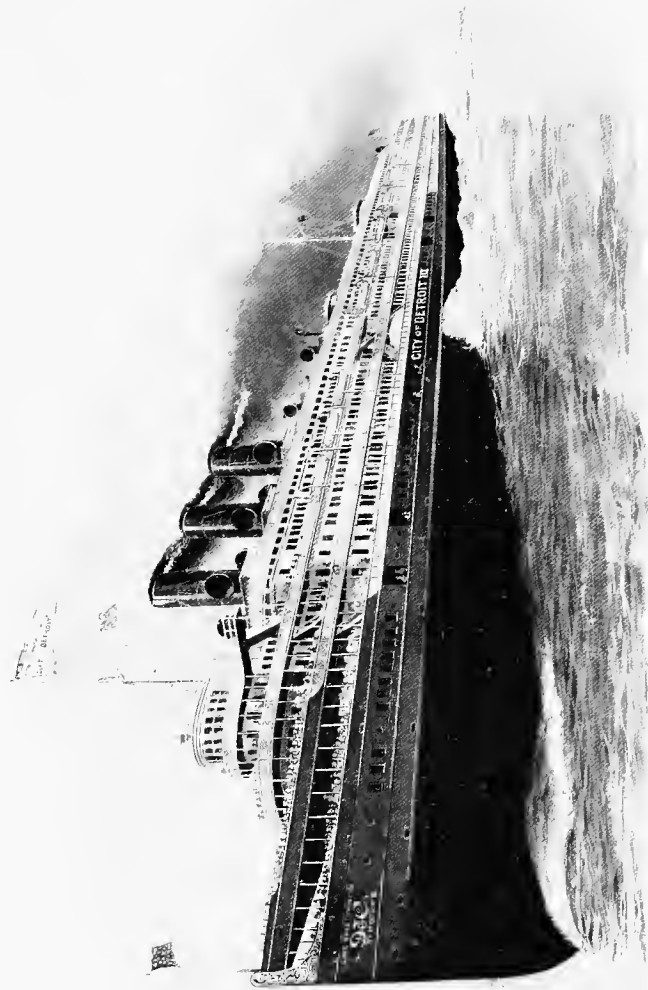
CLASS.	TOTAL.		STEAM.		MOTOR.		SAIL.		UNRIGGED.	
	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.
Total.....	3,462	2,747,687	1,362	2,404,763	1,081	15,863	162	145,450	857	181,611
5 to 49 tons.....	1,724	28,204	375	10,568	1,045	12,717	49	738	255	4,181
50 to 99 tons.....	398	30,011	200	15,251	28	1,878	4	297	166	12,585
100 to 199 tons.....	210	31,262	65	9,312	6	805	7	1,188	132	19,957
200 to 299 tons.....	163	38,861	42	10,158	2	463	7	1,706	112	26,534
300 to 399 tons.....	120	42,150	39	13,484	.....	.....	7	2,523	74	26,143
400 to 499 tons.....	75	33,852	23	10,495	.....	.....	12	5,616	40	17,741
500 to 999 tons.....	183	132,071	85	62,019	.....	.....	40	26,378	63	43,674
1,000 to 1,499 tons.....	43	53,748	34	43,319	.....	.....	4	4,731	5	5,698
1,500 to 1,999 tons.....	55	95,196	50	86,444	.....	.....	3	5,470	2	3,282
2,000 to 2,499 tons.....	70	158,437	59	133,805	.....	.....	7	15,679	4	8,753
2,500 to 2,999 tons.....	32	88,077	29	80,034	.....	.....	2	5,443	1	2,600
3,000 to 3,999 tons.....	82	293,716	65	236,579	.....	.....	14	46,674	3	10,463
4,000 to 4,999 tons.....	122	558,000	119	544,320	.....	.....	3	13,680	.....	.....
5,000 to 5,999 tons.....	43	234,207	40	219,080	.....	.....	3	15,127	.....	.....
6,000 to 6,999 tons.....	95	614,959	95	614,959	.....	.....	.....	.....	.....	.....
7,000 tons and over.....	42	314,936	42	314,936	.....	.....	.....	.....	.....	.....

Table 9 shows that there were, in 1916, 42 Great Lakes steamers of 7,000 gross tons and over, with an aggregate of 314,936 tons, compared with 9 vessels of this class, with a tonnage of 64,338 tons, in 1906. The increase in tonnage amounted to 389.5 per cent during the decade. All vessels of 6,000 gross tons and over were steam vessels, but 3 of the 43, with a ton-

nage between 5,000 and 6,000 tons, were sailing vessels.

VALUATION OF VESSELS.

The value of active lake carriers in 1916, as shown by Table 1, was \$174,765,526, as compared with \$130,805,640 in 1906, showing an increase for the decade



STEAMER "CITY OF DETROIT III."



NEW IRON ORE DOCK AT DULUTH, MINN.

of 33.6 per cent. The value of steam and unrigged craft increased during the same period 38.7 per cent and 22 per cent, respectively; the value of sail vessels, however, decreased 39 per cent, due to the large decrease in the number of these vessels, the average value having practically doubled between 1906 and 1916. Tables 1 and 4 of this section show the value of steam, sail, and unrigged craft separately for 1916, 1906, and 1889, and Table 6 shows the value of metal, wood, and composite craft separately. The percentage of the total value represented by each group of vessels, classified by method of propulsion and also by character of construction, is shown in Table 10.

TABLE 10.—VALUE OF VESSELS—PER CENT OF TOTAL, BY CLASS AND CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.

CLASS AND CHARACTER OF CONSTRUCTION.	PER CENT OF TOTAL VALUE.		
	1916	1906	1889
Class of vessel:			
Steam ¹	91.4	89.4	84.1
Motor.....	1.5	.....	.....
Sail.....	2.5	5.5	8.7
Unrigged.....	4.7	5.1	7.1
Character of construction:			
Metal.....	88.8	80.8	21.7
Wood.....	8.9	18.4	75.7
Composite.....	2.3	.8	2.5

¹ Includes craft propelled by machinery in 1906 and 1889.

The increasing substitution of steam power for sail, and of metal for other materials used in construction, is well indicated in Table 10. Schooner barges compose a part of the 2.5 per cent that the value of the sailing vessels forms of the total value of all vessels, and the elimination of these reduces the proportion for 1916 to nine-tenths of 1 per cent, the corresponding percentage for 1906 being 1.4.

The average value per gross ton of steam vessels, as shown in Table 4, was \$61 in 1906 and \$67 in 1916, a slight increase. There was also an increase in the average value per ton of sailing vessels, from \$27 in 1906 to \$30 in 1916, and in unrigged vessels, from \$32 per gross ton in 1906 to \$45 in 1916. The average values per ton for metal, wooden, and composite vessels were \$64, \$33, and \$47, respectively, in 1906, and \$66, \$46, and \$95 in 1916.

GOVERNMENT VESSELS.

The cities of Chicago, Buffalo, Cleveland, Detroit, and Milwaukee own and operate boats for fire protection and other purposes, and a few of the states bordering on the Great Lakes do likewise for governmental purposes. The principal statistics for craft owned by city or state governments and operated on the Great Lakes are shown in Table 11.

TABLE 11.—VESSELS OWNED AND OPERATED BY STATE AND CITY GOVERNMENTS: 1916.

CITY, STATE, AND CLASS OF VESSEL.	Number of vessels.	TONNAGE.		KIND OF CRAFT.			Horse-power of engines.	CONSTRUCTION.		Value of vessels.	EMPLOYEES.	
		Gross.	Net.	Steam.	Motor.	Unrigged.		Metal.	Wood.		Number.	Wages.
Aggregate.....	50	5,637	3,779	23	12	15	11,677	16	134	\$1,413,111	376	\$432,893
Chicago.....	28	3,586	2,489	9	5	14	4,490	7	21	661,768	198	200,545
Fire boats.....	6	1,271	276	6	.....	.....	3,570	3	3	430,317	85	123,317
All other.....	22	2,315	2,213	3	5	14	920	4	18	231,451	113	77,228
Buffalo, fire boats.....	3	431	252	3	.....	.....	1,550	3	.....	185,000	46	60,700
Cleveland.....	4	362	221	3	.....	.....	615	2	2	109,600	40	48,201
Fire boats.....	2	221	116	2	.....	.....	500	2	.....	100,000	26	32,900
All other.....	2	141	105	1	1	.....	112	.....	2	9,600	14	15,301
Detroit, fire boats.....	2	408	237	2	.....	.....	1,847	2	.....	190,793	18	34,980
Milwaukee, fire boats.....	4	611	405	4	.....	.....	2,800	2	12	238,000	59	75,146
Michigan.....	3	58	42	.....	3	.....	134	.....	3	8,800	7	4,999
New York.....	2	43	43	.....	1	1	40	.....	2	300	.....	.....
Ohio.....	1	76	44	.....	.....	.....	150	.....	1	10,000	4	3,522
Pennsylvania.....	1	43	29	.....	.....	.....	14	.....	1	7,000	4	4,800
Wisconsin.....	2	19	.....	.....	2	.....	40	.....	2	1,850	.....	.....

¹ Includes one "composite."

The craft shown separately in Table 11 are included in the statistics shown in other tables. In 1916 the total number of these craft was 50, while the number reported in 1906 was 38, an increase of 12 during the decade. Chicago reported the largest number of vessels owned by any city, an increase of 4 from 1906 to 1916—1 fire boat and 3 boats for other purposes. The city of Milwaukee also reported 2 more vessels in 1916 than in 1906.

FISHING VESSELS.

As previously stated in this report, statistics of fishing vessels were not collected at the census of 1906, and therefore have not been included in the number

of vessels shown in the comparative tables of the present report. Table 12 gives the principal statistics for fishing vessels, arranged by tonnage groups, for 1916.

There were 606 steam and motor vessels engaged in fishing in 1916. These had a gross tonnage of 10,196 and were valued at \$1,190,866. There was an average of 3 persons employed on each of these vessels and the aggregate wages paid was \$949,562, while the income from the fishing on the Great Lakes was reported as \$2,129,489. The table shows the majority of the fishing vessels were motor vessels and only 19 of the entire number were of more than 50 gross tons.

TABLE 12.—FISHING VESSELS: 1916.

	Number of vessels.	Gross tons.	Value.	Gross income.	Number employed on vessels.	Wages.	AVERAGE PER VESSEL.					Average wages per employee.
							Tons.	Value.	Income.	Number employed on vessels.	Wages.	
Total.....	606	10,196	\$1,190,866	\$2,129,489	1,807	\$949,562	17	\$1,965	\$3,514	3	\$1,567	\$525
Less than 50 tons, gross.....	587	8,999	1,058,048	1,913,515	1,667	849,823	15	1,802	3,260	3	1,448	510
50 tons and over, gross.....	19	1,197	132,818	215,974	140	99,739	63	6,990	11,367	7	5,249	712
Steam.....	209	6,436	825,643	1,335,195	1,070	657,516	31	3,950	6,388	5	3,146	615
Less than 50 tons, gross.....	191	5,289	697,025	1,127,721	935	561,617	28	3,649	5,904	5	2,940	601
50 tons and over, gross.....	18	1,147	128,618	207,474	135	95,899	64	7,145	11,526	8	5,328	710
Motor.....	397	3,760	365,223	794,294	737	292,046	9	920	2,001	2	736	396
Less than 50 tons, gross.....	396	3,710	361,023	785,794	732	288,206	9	912	1,984	2	728	394
50 tons and over, gross.....	1	50	4,200	8,500	5	3,840	50	4,200	8,500	5	3,840	768

INCOME.

Table 13 shows the gross income from lake shipping in 1916 and 1906, segregated according to source. In 1906 statistics of freight shipments for the Great Lakes were derived from the reports of the Bureau of Statistics of the Department of Commerce and Labor. For the present report, however, the Bureau of the Census obtained its freight statistics directly from vessel owners.

TABLE 13.—GROSS INCOME: 1916 AND 1906.

CLASS.	INCOME.		Per cent of increase, ¹ 1906-1916
	1916	1906	
Total.....	\$85,095,887	\$65,274,702	30.4
Freight.....	70,377,339	52,076,533	35.1
Passengers.....	6,879,005	4,866,904	41.3
All other sources.....	7,839,543	8,331,265	-5.9

¹ A minus sign (-) denotes decrease.

Gross earnings of the Great Lakes fleet were \$85,095,887 in 1916, compared with \$65,274,702 in 1906, an increase of 30.4 per cent in the 10 years.

Freight is the principal source of income of lake vessels, constituting 82.7 per cent of the total income.

The increase of freight revenue for 1916 over 1906, however, was only 35.1 per cent, as compared with an increase of 65.8 per cent in tonnage of freight shipments. Length of haul on "through" freight, which is the dominating factor in lake shipments, was about the same in 1916 as in 1906, as shown by reports of the Corps of Engineers, United States Army. Decrease in lake freight rates—notably on iron ore, from 67 cents per ton in 1906 to 57 cents in 1916, for the haul from Duluth-Superior to Lake Erie, and on coal from 35 cents in 1906 to 30 cents in 1916, for the haul from Lake Erie to upper lake ports—apparently was effective in restricting the margin of increase in 1916 over 1906 shipping income.

FREIGHT.

The Great Lakes fleet in 1916 handled a greater annual tonnage of freight shipments than the vessels of the entire Atlantic, Gulf, and Pacific seaboard. Lake vessels handled 98.9 per cent of the American production of iron ore, besides a large percentage of the country's coal, grain, and flour.

Table 14 is a comparative statement, for 1916, 1906, and 1889, of the domestic shipments and receipts of the principal commodities of Great Lakes commerce.

TABLE 14.—SHIPMENTS AND RECEIPTS OF DIFFERENT COMMODITIES, WITH PER CENT OF TOTAL FOR EACH COMMODITY: 1916, 1906, AND 1889.

COMMODITY.	SHIPMENTS.						RECEIPTS.					
	Tons (2,000 pounds).			Per cent of total.			Tons (2,000 pounds).			Per cent of total.		
	1916	1906	1889	1916	1906	1889	1916	1906	1889	1916	1906	1889
Total.....	125,384,042	175,609,649	25,266,974	100.0	100.0	100.0	125,384,042	73,178,213	25,936,132	100.0	100.0	100.0
Canned goods.....	14,951			(³)			14,951			(³)		
Cement, brick, lime.....	199,913			0.2			199,913			0.2		
Coal.....	30,179,847	117,575,467	6,106,799	24.1	23.2	24.2	30,179,847	15,532,715	4,516,471	24.1	21.2	19.9
Flour.....	1,085,290	1,334,979		0.9	1.8		1,085,290	1,338,189		0.9	1.8	
Fruits and vegetables.....	117,906			0.1			117,906			0.1		
Grain.....	5,969,521	3,689,329	2,898,764	4.8	4.9	11.4	5,969,521	3,463,472	2,503,063	4.8	4.7	9.7
Iron ore.....	72,614,761	41,297,209	7,677,107	57.9	54.6	30.4	72,614,761	41,318,928	7,626,073	57.9	56.5	29.4
Lumber.....	1,629,756	3,615,140	5,348,398	1.3	4.8	21.2	1,629,756	3,497,110	6,857,257	1.3	4.8	26.4
Petroleum and other oils.....	314,959			0.3			314,959			0.3		
Pig iron and steel rails.....	184,188	414,110		0.1	0.5		184,188	434,178		0.1	0.6	
Salt.....	(⁶)	567,986	252,837		0.8	1.0	(⁶)	554,811	296,513		0.8	1.1
Stone, sand, etc.....	7,506,452			6.0			7,506,452			6.0		
All other commodities.....	5,566,498	7,115,429	2,984,069	4.4	9.4	11.8	5,566,498	7,038,810	3,490,755	4.4	9.6	13.5

¹ Includes 2,003,453 net tons of bunker coal.
² Does not include 6,088,046 tons of lighterage.

³ Less than one-tenth of 1 per cent.
⁴ Includes coke.

⁵ Did not include steel rails in 1906.
⁶ Not reported separately.

Iron ore is the chief factor in lake freight transportation, representing 57.9 per cent of the total shipments in 1916, compared with 54.6 per cent in 1906 and 30.4 per cent in 1889. Iron ore shipments reached a total of 72,614,761 short tons in 1916, compared with 41,297,209 in 1906, an increase of 31,317,552 tons, or 75.8 per cent. Coal, likewise, showed marked gains, 30,179,847 tons being reported for shipments in 1916, compared with 17,575,467 in 1906, an increase of 12,604,380 tons, or 71.7 per cent. Ship-

ments of lumber have continued to decrease. Aggregate freight shipments amounted to 125,384,042 net tons in 1916, compared with 75,609,649 in 1906 and 25,266,974 in 1889. The percentage of increase was 65.8 per cent for 1916 over 1906, and of 396.2 per cent for 1916 over 1889.

Tonnage, by ports.—Table 15 is a comparative statement, for 1916, 1906, and 1889, of domestic shipments and receipts of freight by principal ports on the Great Lakes and St. Lawrence River.

TABLE 15.—SHIPMENTS AND RECEIPTS OF FREIGHT AT PRINCIPAL PORTS ON THE GREAT LAKES AND ST. LAWRENCE RIVER, WITH PER CENT OF TOTAL SHOWN FOR EACH PORT: 1916, 1906, AND 1889.

PORT.	TOTAL FREIGHT TONNAGE HANDLED AT PORT.			SHIPMENTS.									RECEIPTS.					
				Tons (2,000 pounds).			Per cent of total.						Tons (2,000 pounds).			Per cent of total.		
	1916	1906	1889	1916	1906	1889	1916	1906	1889	1916	1906	1889	1916	1906	1889	1916	1906	1889
Total.....				125,384,042	75,609,649	25,266,974	100.0	100.0	100.0	125,384,042	73,178,213	25,936,132	100.0	100.0	100.0			
Ashland, Wis.....	10,030,144	4,407,081	2,247,242	9,250,271	3,774,931	1,759,884	7.4	6.0	7.0	7,773,873	632,100	487,358	0.6	0.9	1.9			
Ashtabula, Ohio.....	17,429,436	10,157,785	2,695,180	4,521,184	2,481,670	4,889,585	3.6	3.3	1.9	12,908,252	7,676,115	2,205,595	10.3	10.5	8.5			
Buffalo, N. Y.....	19,316,948	14,345,007	6,730,137	3,494,662	4,201,316	2,083,993	2.8	5.6	10.6	15,822,284	10,143,691	4,046,144	12.6	13.9	15.6			
Cheboygan, Mich.....	32,424	172,403	218,940	7,106	148,530	194,417	(2)	0.2	0.8	25,318	23,873	24,523	(2)	(2)	0.1			
Chicago-South Chicago, Ill.	14,329,920	10,357,038	7,984,038	1,307,296	2,510,632	2,914,065	1.0	3.3	11.5	13,022,624	7,846,406	5,069,973	10.4	10.7	19.5			
Cleveland, Ohio.....	16,402,987	11,670,328	3,621,570	2,946,735	3,434,962	883,862	2.3	4.5	3.5	13,456,252	8,235,366	2,737,708	10.7	11.3	10.6			
Conneaut, Ohio.....	12,563,823	6,972,996	(^a)	1,443,060	888,854	(^a)	1.2	1.2	-----	11,120,763	6,084,142	(^a)	8.9	8.3	-----			
Detroit, Mich.....	1,740,385	1,184,862	764,553	280,777	208,223	148,803	0.2	0.3	0.6	1,459,608	981,639	615,750	1.2	1.3	2.4			
Duluth-Superior ^d	52,787,525	29,369,200	2,294,345	42,082,083	23,079,956	735,491	33.6	30.5	2.9	10,705,442	6,289,244	1,558,854	8.5	8.6	6.0			
Erie, Pa.....	3,927,580	3,906,739	1,271,988	1,723,024	1,070,415	498,958	1.4	1.4	2.0	2,199,556	2,836,324	773,030	1.8	3.9	3.0			
Escanaba, Mich.....	8,477,762	6,937,210	3,626,390	7,992,317	6,412,483	3,430,832	6.4	8.5	13.6	485,445	524,727	195,558	0.4	0.7	0.8			
Fairport, Ohio.....	3,947,084	2,506,903	998,459	514,058	295,439	59,438	0.4	0.4	0.2	3,433,026	2,211,464	939,021	2.7	3.0	3.6			
Frankfort, Mich.....	1,947,790	831,161	(^a)	846,986	441,823	(^a)	0.7	0.6	-----	1,100,804	389,338	(^a)	0.9	0.5	-----			
Gladstone, Mich.....	76,511	546,531	287,590	2,191	224,825	155,234	(2)	0.3	0.6	74,320	321,706	132,356	0.1	0.4	0.5			
Grand Haven, Mich.....	717,201	420,541	169,546	276,377	145,249	68,396	0.2	0.2	0.3	440,824	275,292	101,150	0.4	0.4	0.4			
Green Bay, Wis.....	623,287	726,958	156,810	10,394	107,008	55,441	(2)	0.1	0.2	612,893	619,950	101,369	0.5	0.8	0.4			
Hancock-Houghton, Mich. ^a	1,306,215	526,554	286,191	105,147	66,572	78,144	0.1	0.1	0.3	1,201,068	459,982	208,047	1.0	0.6	0.8			
Huron, Ohio.....	2,440,934	1,659,690	70,180	1,004,165	783,273	56,456	0.8	1.0	0.2	1,436,769	876,417	13,694	1.1	1.2	0.1			
Kewauqua, Wis.....	331,607	143,466	32,627	180,073	60,758	23,354	0.1	0.1	0.1	151,534	82,708	9,273	0.1	0.1	(2)			
Lorain, Ohio.....	8,384,656	4,211,733	620,773	3,134,241	1,698,823	273,874	2.5	2.2	1.1	5,250,415	2,102,910	340,899	4.2	3.4	1.3			
Ludington, Mich.....	1,662,143	1,663,718	627,627	961,607	956,593	351,398	0.8	1.3	1.4	700,536	707,125	276,229	0.6	1.0	1.1			
Manistee, Mich.....	82,297	521,841	629,910	51,923	488,239	601,814	(2)	0.6	2.4	30,374	33,602	28,096	(2)	(2)	0.1			
Manistique, Mich.....	583,067	499,350	144,011	356,517	332,562	140,321	0.3	0.4	0.6	236,550	166,788	3,690	0.2	0.2	(2)			
Manitowish, Wis.....	1,809,263	1,237,790	113,377	788,892	577,064	25,023	0.6	0.8	0.1	1,020,371	660,726	88,354	0.8	0.9	0.3			
Marine City, Mich.....	100,482	81,054	61,001	52,526	35,362	15,426	(2)	0.1	0.4	47,956	45,692	45,575	(2)	0.1	0.2			
Marquette, Mich.....	4,712,482	1,810,685	1,710,885	4,341,874	1,531,965	1,567,539	3.5	2.0	6.2	370,608	278,720	143,346	0.3	0.4	0.6			
Menominee, Mich.....	425,242	200,924	272,529	181,523	97,099	265,103	0.2	0.1	1.0	243,719	109,825	7,426	0.2	0.1	(2)			
Milwaukee, Wis.....	7,929,084	6,236,146	1,935,808	1,203,257	1,233,293	351,554	1.0	1.6	1.4	6,725,827	5,002,853	1,584,254	5.4	6.8	6.1			
Muskegon, Mich.....	87,291	119,877	1,002,743	25,151	61,517	851,440	(2)	0.1	3.4	62,140	58,360	151,303	0.1	0.1	0.6			
Ogdensburg, N. Y.....	360,422	465,337	662,904	10,594	56,082	192,860	(2)	0.1	0.8	349,828	409,255	470,044	0.3	0.6	1.8			
Oswego, N. Y.....	648,858	54,777	691,118	582,896	37,436	283,271	0.5	(2)	1.1	65,962	17,341	402,847	0.1	(2)	1.6			
Port Huron, Mich.....	212,130	358,077	170,073	36,234	211,232	18,000	(2)	0.3	0.1	175,806	146,845	152,073	0.1	0.2	0.6			
Racine, Wis.....	130,516	176,983	160,537	28,263	17,147	1,225	(2)	(2)	(2)	102,253	159,841	159,312	0.1	0.2	0.6			
Sandusky, Ohio.....	2,951,843	954,290	602,403	2,599,216	824,813	297,374	2.1	1.1	1.2	352,627	129,477	305,029	0.3	0.2	1.2			
Sault Ste. Marie, Mich.....	1,413,046	438,954	76,125	30,381	243,565	39,062	(2)	0.3	0.2	1,382,665	195,389	37,063	1.1	0.3	0.1			
Sheboygan, Wis.....	654,832	525,018	124,387	11,927	15,089	8,392	(2)	(2)	(2)	642,905	609,929	115,995	0.5	0.7	0.4			
Toledo, Ohio.....	9,157,292	4,167,813	1,436,991	6,812,923	2,350,837	980,640	5.4	3.1	3.7	2,344,369	1,816,976	506,351	1.9	2.5	2.0			
Tonawanda Harbor.....	399,059	1,079,146	1,046,895	23,968	23,968	-----	(2)	-----	-----	399,059	1,055,178	1,046,895	0.3	1.5	4.0			
Two Harbors, Minn.....	12,189,260	9,316,743	936,541	11,892,074	9,018,987	936,541	9.5	1.9	3.7	297,186	297,756	-----	0.2	0.4	-----			
Washburn, Wis.....	211,779	373,119	188,393	30,952	170,072	133,301	(2)	0.2	0.5	180,827	203,047	55,092	0.1	0.3	0.2			
All other ports.....	28,223,479	7,462,079	4,532,289	14,252,165	5,295,985	3,741,433	11.4	7.0	14.8	13,971,314	2,156,094	790,856	11.1	2.9	3.0			

¹ Includes 2,003,453 net tons of bunker coal.

² Less than one-tenth of 1 per cent.

³ Not reported.

^d Includes West Superior.

^e Includes Portage, Dollar Bay, Hubbell, Ripley, and Lake Linden.

Table 15 shows the relative standing of ports with respect to the freight handled. A feature of lake transportation is the excess of eastbound over westbound tonnage. Receipts at Lake Erie ports outweigh shipments, while on Lake Superior shipments far exceed receipts.

Duluth-Superior Harbor, at the western head of the Great Lakes system, had the distinction in 1916 of shipping a greater freight tonnage than any other

American port, and also leads among lake ports in total commerce handled. Shipments from that port in 1916 in American-owned vessels reached 42,082,083 tons, compared with 23,079,956 tons in 1906, a ten-year growth of 82.3 per cent.

Buffalo, at the eastern extremity of Lake Erie, leads other lake ports in freight receipts, with a total of 15,882,284 tons, compared with 13,456,252 tons received at Cleveland, 13,022,624 at Chicago-South

Chicago, 12,908,252 at Ashtabula, 11,120,763 at Conneaut, and 10,705,442 at Duluth-Superior. The rate of growth in freight receipts at Buffalo was 56 per cent from 1906 to 1916 and 291 per cent from 1889 to 1916.

Iron ore.—Table 16 is a comparative statement of the shipments and receipts of iron ore, by principal ports, for 1916, 1906, and 1889.

TABLE 16.—IRON ORE MOVEMENT, BY PORTS:
1916, 1906, AND 1889.

PORT.	SHIPMENTS. (TONS OF 2,000 POUNDS).			RECEIPTS (TONS OF 2,000 POUNDS).		
	1916	1906	1889	1916	1906	1889
Total.....	72,614,761	41,297,209	7,677,107	72,614,761	41,318,928	7,626,073
Ashland.....	9,238,903	3,627,593	1,663,021			
Ashtabula.....		3,192		12,828,167	7,534,108	2,199,109
Buffalo.....		18,637		8,709,166	5,186,744	333,827
Chicago-South Chi- cago.....				8,796,376	4,762,150	731,188
Cleveland.....		370	26,644	12,289,920	7,491,495	1,951,504
Conneaut.....		(1)		11,084,463	6,061,615	(1)
Detroit.....		1,568	(2)	434,210	177,000	(3)
Duluth-Superior.....	39,020,088	19,193,515				10,691
Erie.....		63		1,925,743	2,348,985	418,426
Escanaba.....	7,975,814	6,335,682	3,364,067			
Fairport.....				3,099,570	2,052,538	928,616
Gary.....				2,954,436		
Huron.....		11,891		1,400,964	871,697	761
Indiana Harbor.....				927,073		
Lorain.....				5,124,244	2,417,108	335,162
Marquette.....	4,323,740	1,518,043	1,541,495			
Milwaukee.....		10,285		248,513	305,443	124,312
Port Huron.....		1,120		18,737		
Presque Isle.....	13,811	1,586,656				
Sandusky.....					35,861	208,411
Sault Ste. Marie.....		4,928		378,001	9,520	
Toledo.....	8,887			2,121,198	1,611,004	97,476
Tonawanda.....		448		(2)	320,034	17,166
Two Harbors.....	11,875,930	8,862,028	936,541			
All other ports.....	147,081	121,190	145,339	273,969	163,625	269,364

¹ Not reported.

² Separate figures not available (included in "all other ports").

As shown in connection with Table 14, iron ore in 1916 constituted 57.9 per cent of total lake freight shipments, and Table 16 shows there was carried from Lake Superior ports to lower lake ports a record total of 72,614,761 net tons.

The records of iron ore shipments and receipts, by ports, for the years 1916, 1906, and 1889 show that Duluth-Superior stands as the leading shipping port for iron ore, handling over one-half of the total lake shipments, or 39,020,088 short tons in 1916, as compared with 19,193,515 tons in 1906. Two Harbors, Minn., is second, with 11,875,930 tons of ore shipments; followed by Ashland, Wis., 9,238,903 tons; Escanaba, Mich., 7,975,814 tons; and Marquette, Mich., with 4,323,740 tons.

Of the iron ore receipts, 12,926,400 short tons in 1916 went to Lake Michigan furnaces at South Chicago, Gary, Hammond (Indiana Harbor), and Milwaukee; while 58,583,444 short tons, or 80.7 per cent of the total, went to Lake Erie ports, such as Ashtabula, Buffalo, Cleveland, Conneaut, Erie, Fairport, Huron, Lorain, and Toledo, to supply the furnaces of Ohio, Pennsylvania, and New York, and, in particular, the Pittsburgh steel district. The steel development at lower Lake Michigan industrial

centers is indicated by a growth of iron ore receipts from 855,500 tons in 1889 to 5,067,593 tons in 1906, and to 12,926,400 tons in 1916.

As an indication of the development of the iron and steel industry, iron ore receipts of Lake Erie ports have grown steadily from 6,264,941 short tons in 1889 to 35,545,295 in 1906, and to 58,583,444 in 1916, having in 1916 increased 64.8 per cent since 1906, and upwards of eightfold since 1889.

Coal.—Table 17 is a comparative statement of the shipments and receipts of coal, by principal ports, for 1916, 1906, and 1889.

TABLE 17.—COAL MOVEMENT, BY PORTS: 1916, 1906, AND 1889.

PORT.	SHIPMENTS (TONS OF 2,000 POUNDS).			RECEIPTS (TONS OF 2,000 POUNDS).		
	1916	1906	1889 ¹	1916	1906	1889 ¹
Total.....	30,179,847	17,575,467	6,105,799	30,179,847	15,532,715	5,162,471
Ashland.....		2,202		773,801	521,195	201,241
Ashtabula.....	4,403,431	2,477,885	489,585	34,100		
Buffalo.....	2,872,400	3,112,577	2,156,670	76,329	1,112	
Charlotte.....	1,012,200	180,634	350,000			
Chicago-South Chi- cago.....		14,087		1,625,045	938,151	1,329,364
Cleveland.....	2,626,458	2,905,506	825,030		4,629	1,200
Conneaut.....	1,387,907	846,948	(3)	19,000		(3)
Detroit.....	241,727	115,588		386,402	147,262	
Duluth-Superior.....	350	62,776	3,564	61,127	26,905	141,900
Erie.....	10,882	17,720		9,514,222	5,330,119	1,205,000
Escanaba.....	1,663,170	926,099	410,403			
Fairport.....	10,332	8,649		483,220	512,672	194,199
Fair Haven.....	46,747	2,635	119,317	7,700		
Fairport.....	454,067	276,328	59,438		3,400	
Frankfort.....	259,775	228,813	(3)	65	125	(3)
Gladstone.....		60		74,059	224,773	122,000
Green Bay.....	440	3,705	12	586,343	380,757	70,374
Hancock-Houghton ⁴	200	386	25,075	1,165,003	883,737	144,261
Huron.....	1,008,196	771,375	56,000			235
Indiana Harbor.....				398,259		
Lorain.....	3,133,971	1,697,370	273,671	13		
Ludington.....	388,375	518,948		48,529	20,893	4,583
Manitowoc.....	15,152	5,894		590,976	444,190	75,000
Marquette.....		175		368,378	273,443	126,421
Milwaukee.....	2,323	13,986		5,277,070	3,659,491	907,743
Ogdensburg.....	7,502	1,752	65,356	286,202	192,569	66,231
Oswego.....	577,563	37,265	282,098		681	
Sandusky.....	2,587,336	749,084	275,385			1,561
Sault Ste. Marie.....	835	32,156	1,000	976,184	168,082	24,938
Sheboygan.....	1,096	578	200	618,727	440,216	50,000
Toledo.....	6,777,728	2,325,259	650,000	9,021	23,957	93,369
Two Harbors.....	9,919	1,859		296,962	288,935	
Washburn.....	14	867		180,827	166,519	51,614
All other ports.....	670,295	134,800	62,995	6,321,283	878,872	351,237

¹ Includes coke.

² Includes 2,003,453 net tons of bunker coal.

³ Not reported.

⁴ Includes Portage, Dollar Bay, Hubbell, Lake Linden, and Ripley.

⁵ Includes St. Marys Falls.

The heavy eastbound iron ore movement has its complement in a large and growing westbound coal movement, the coal furnishing return cargoes for iron ore carriers. Lake coal shipments increased from 6,105,799 tons in 1889 to 17,575,467 in 1906, and to 30,179,847 tons in 1916. In other words, in 1916 the coal movement showed an increase of 71.7 per cent over 1906 and 394.3 per cent over 1889. Toledo, Ashtabula, Lorain, Buffalo, Cleveland, Sandusky, Erie, and Conneaut, in the order named, are leading ports of coal shipments from Lake Erie, while Charlotte (lake port for Rochester, N. Y.) is the principal coal shipping point on Lake Ontario.

The leading port in coal receipts was Duluth-Superior, 9,514,222 tons being received in 1916, compared with 5,330,119 in 1906 and 1,205,000 in 1889, an increase

for 1916 of 78.5 per cent over 1906 and 689.6 per cent over 1889. Milwaukee, Chicago, Hancock-Houghton, Sault Ste. Marie, Ashland, and Sheboygan follow, in the order named, in tonnage of coal receipts.

Lumber.—Table 18 is a comparative statement of the shipments and receipts of lumber, by principal ports, for 1916, 1906, and 1889.

TABLE 18.—LUMBER MOVEMENT, BY PORTS: 1916, 1906, AND 1889.

PORT.	SHIPMENTS (TONS OF 2,000 POUNDS).			RECEIPTS (TONS OF 2,000 POUNDS).		
	1916	1906	1889	1916	1906	1889
Total.....	1,629,756	3,615,140	5,348,398	1,629,756	3,497,110	6,857,257
Alpena.....	5,652	88,468	373,204			
Bay City.....		2,804	481,596	47,080	64,084	4,200
Buffalo.....	43,094	4,484		260,097	275,420	408,951
Chicago-South Chicago.....	1,650	1,626	2,106	209,006	810,844	2,588,004
Cleveland.....		3,026	1,092	112,462	350,290	565,626
Detroit.....		1,270	10,261	77,527	182,186	314,995
Duluth.....	447,526	922,954	13,110	2,429	6,546	
East Tawas.....		1,656	212,467			383
Ludington.....	19,230	66,018	258,520	195,805	281,540	
Manistee.....	18,513	199,136	477,785	120	860	
Manitowoc.....	212,571	231,224	5,625	8,557	19,498	8,126
Marinette.....	24,648	105,610	341,445	4,273	6,410	278
Menominee.....	89,685	50,562	265,103	5,186	2,482	
Milwaukee.....	45,162	114,060		25,699	143,912	412,479
Muskegon.....		28,212	846,615	2,801	23,366	119,530
Oscoda.....		33,072	498,962			
Oswego.....		100		2,068	5,370	283,058
Toledo.....	456	374	5,108	19,448	75,598	282,399
Tonawanda Harbor.....		2,926		353,175	712,918	1,029,729
All other parts.....	721,571	1,757,558	1,504,399	304,083	535,870	844,499

Lumber, which in 1889 was one of the leading commodities of Great Lakes commerce, has declined, until in 1916 only slightly more than one-fourth of the 1889 tonnage was handled by the Great Lakes fleet. Of the separate ports shown in Table 18, Duluth, Manitowoc, and Menominee are the principal shipping ports of lumber, while Tonawanda Harbor, Buffalo, and Chicago lead in lumber receipts.

Grain.—As stated elsewhere, the statistics of freight for the Great Lakes in 1906 were derived from the reports of the Bureau of Statistics. The principal grains only were shown, and therefore, no comparison can be made by ports, as the Census Office in 1916 collected statistics for "grain."

Table 19 shows the shipments and receipts of grain, by principal ports, for 1916.

There was a large eastbound grain movement through the Lakes in 1916 to meet war demands, lake shipments reaching 5,969,521 net tons, as shown in Table 19. Duluth-Superior was the principal port of shipment, handling more than one-third of the total grain shipments. Over three-fourths of the ship-

ments were destined for the grain terminals at Buffalo, there to be reshipped via rail and the Erie Canal for the Atlantic seaboard and for Europe.

TABLE 19.—GRAIN MOVEMENT, BY PORTS: 1916.

PORT.	Shipments (tons of 2,000 pounds).	Receipts (tons of 2,000 pounds).
Total.....	5,969,521	5,969,521
Ashtabula.....	15,030	5,460
Buffalo.....		4,636,503
Chicago-South Chicago.....	627,128	28,354
Cleveland.....	27,918	42,149
Detroit.....	15,217	30,931
Duluth-Superior.....	1,844,910	62,234
Erie.....		11,544
Fairport.....		133,305
Frankfort.....	804	76,469
Kewaunee.....	36,815	
Lorain.....		10,482
Ludington.....	36,207	170,663
Manitowoc.....	92,256	2,945
Milwaukee.....	184,387	40,690
Ogdensburg.....	359	53,450
Oswego.....		63,204
Racine.....	7,931	
Toledo.....		32,691
All other ports.....	3,080,559	568,547

Freight, by ports and commodities.—Table 20 presents, by principal ports, total receipts and shipments of the leading commodities of Great Lakes commerce for 1916.

Among the commodities aggregating large tonnages, shown in Table 20 but not shown in other tables, is "stone, sand, etc.," for which 7,506,452 tons were reported as shipped on the Lakes, this item ranking next after iron ore and coal, which together amounted to 102,794,608 tons shipped in 1916.

Leading ports in receipts and shipments of freight, with principal commodities handled by each, in the order of their importance are: Duluth-Superior, iron ore and grain shipped and coal received; Buffalo, iron ore, grain, stone and sand, etc., and flour received and coal and miscellaneous freight shipped; Ashtabula, iron ore received and coal shipped; Cleveland, iron ore received and coal shipped; Chicago-South Chicago, iron ore, coal, miscellaneous freight, and lumber received and grain, miscellaneous freight, and petroleum shipped; Conneaut, iron ore received, coal shipped; Two Harbors and Ashland, iron ore shipped, coal received; Lorain, iron ore received and coal shipped; Toledo, coal shipped and iron ore received; Escanaba, iron ore shipped and coal received; and Milwaukee, coal, miscellaneous freight, stone and sand, etc., and iron ore received and miscellaneous freight, grain, and flour shipped.

TRANSPORTATION BY WATER.

TABLE 20.—SHIPMENTS AND RECEIPTS AT PRINCIPAL

[Tons of 2,000 pounds.]

PORT.	TOTAL FREIGHT.		CANNED GOODS.		CEMENT, BRICK, AND LIME.		COAL.		FLOUR.		FRUITS AND VEGETABLES.	
	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.
1 Total.....	125,384,042	125,384,042	14,951	14,951	199,913	199,913	30,179,847	30,179,847	1,085,290	1,085,290	117,906	117,906
2 Alpena, Mich.....	1,237,944	624,242			110,630			619,536				
3 Ashland, Wis.....	9,256,271	773,873	2		3		310	773,801	3			
4 Ashtabula, Ohio.....	4,521,184	12,908,252			102		4,403,431	34,100				
5 Buffalo, N. Y.....	3,494,662	15,822,284	4,675	6,699	58,904	17	2,872,409	76,329		804,709	41	
6 Calcite, Mich.....	3,194,144	5,816						5,816				
7 Charlotte, N. Y.....	1,012,200						1,012,200					
8 Chicago-South Chicago, Ill.....	1,307,296	13,022,624	93	898	825	6,202	14,087	1,625,045	229,191		89,651	
9 Cleveland, Ohio.....	2,946,735	13,456,252		3,285		19,540	2,626,458	1,000	3,592	37,273	51	
10 Conneaut, Ohio.....	1,443,060	11,120,763			8,964		1,387,907	19,000				
11 Detroit, Mich.....	245,099	396,596		4			241,727	386,402		83	1	1
12 Detroit, Mich.....	280,777	1,459,608		334		14,500	350	61,127				1,100
13 Duluth-Superior.....	42,082,083	10,705,442	3	2,927	459	68,742	10,882	9,514,222	643,356		823	11,377
14 Erie, Pa.....	1,728,024	2,194,556			2,477		1,663,170			165,782		
15 Escanaba, Mich.....	7,992,317	485,445					10,332	483,220	1		1	1
16 Fairport, Ohio.....	514,058	3,433,026					454,067					
17 Frankfort, Mich.....	846,986	1,100,804					259,775	65	45	6,627	566	
18 Gary, Ind.....		2,956,464										
19 Grand Haven, Mich.....	276,377	440,824										
20 Green Bay, Wis.....	10,394	612,893			25	8,000	440	585,343	45		65	
21 Hancock-Houghton, Mich.....	105,147	1,201,068				2,973	200	1,165,003				
22 Huron, Ohio.....	1,004,165	1,436,769					1,003,196					
23 Indiana Harbor, Ind.....	159,931	1,579,731						398,259				
24 Kewaunee, Wis.....	180,073	1,511,534						57,876	2,472	20		
25 Lorain, Ohio.....	3,134,241	5,250,415					3,133,971	13				
26 Ludington, Mich.....	961,607	700,536					358,375	48,529	11,182	49,549	2,306	
27 Manistee, Mich.....	51,923	30,374			55						181	
28 Manistique, Mich.....	356,517	236,550					2,556	56,701	980			
29 Manitowoc, Wis.....	788,892	1,020,371		25			15,152	590,976	20,584	194		
30 Marine City, Mich.....	52,526	47,956						47,677				
31 Marquette, Mich.....	4,341,874	370,608				380		368,378				
32 Menominee, Mich.....	181,523	243,719	2		280		480	150,160				242
33 Milwaukee, Wis.....	1,203,257	6,725,827	6,606	535	17	57,126	2,323	5,277,070	173,365	11,223		4,963
34 Muskegon, Mich.....	25,151	62,140					200					
35 Ogdensburg, N. Y.....	10,594	349,828					7,502	286,202		47		
36 Oswego, N. Y.....	582,896	65,962					577,563					
37 Port Huron, Mich.....	36,234	175,896			7,104		3,369	114,867				
38 Racine, Wis.....	28,263	102,253						66,082				910
39 Sandusky, Ohio.....	2,599,216	352,627		334			2,587,336					
40 Sault Ste. Marie, Mich.....	30,381	1,382,665		151		10,000	885	976,184	63		114	85
41 Sheboygan, Wis.....	11,927	642,905					1,096	618,727				160
42 Toledo, Ohio.....	6,812,923	2,344,369					6,777,728	9,021	10			
43 Tonawanda Harbor, N. Y.....		399,059						7,608				
44 Two Harbors, Minn.....	11,892,074	297,186					9,919	296,962				
45 Washburn, Wis.....	30,952	180,827					14	180,827				
46 All other ports.....	8,412,144	8,508,103	3,085	269	10,043	12,393	710,437	5,276,719	401	9,783	113,808	9,365

Miscellaneous merchandise, for which 5,566,498 tons are shown, was largely reported from Chicago, Milwaukee, Manitowoc, and the three Michigan ports of Frankfort, Grand Haven, and Ludington, this tonnage resulting from extensive car-ferry business carried on from these ports.

Besides the ports named in the table there are many ports of less importance, with a freight tonnage aggregating 8,412,144 tons of merchandise shipped and 8,508,103 tons received. Among ports not appearing before in the tables are: Calcite, Mich., which contributes to lake commerce 3,170,144 tons of limestone for pig iron manufacture at lake blast furnaces; Charlotte, N. Y., the lake port of Rochester, which shipped 1,012,200 tons of coal in 1916; Gary, Ind., which received 2,954,436 tons of iron ore for iron and steel manufacture; Indiana Harbor, Ind., which received 927,073 tons of iron ore and 254,399 tons of limestone for the furnaces and steel works at Hammond, Ind.

PASSENGERS.

Although of small importance in comparison with the freight business, the passenger traffic on the Great Lakes and St. Lawrence River has reached significant proportions. Table 21 shows the number of passengers carried in 1916, 1906, and 1889, with the income received from passengers in 1916 and 1906.

TABLE 21.—PASSENGERS CARRIED: 1916, 1906, AND 1889.

	1916	1906	1889
Number of passenger carrying vessels.....	296	282	405
Passenger and freight vessels.....	259	236	365
Ferryboats.....	37	46	40
Income from passengers.....	\$6,875,010	\$4,865,736	(3)
Passenger and freight vessels.....	\$6,190,830	\$4,408,880	(3)
Ferryboats.....	\$684,180	\$456,856	(3)
Number of passengers carried.....	19,214,076	14,079,121	2,235,993
On passenger and freight vessels.....	5,919,885	5,814,639	1,612,519
On ferryboats.....	13,294,191	8,264,482	623,474

¹ Exclusive of \$6,679 reported as income from 35,616 passengers carried on 11 tug and fishing vessels.

² Exclusive of \$1,168 reported as income from 1,025 passengers carried on tugs and other towing vessels.

³ Not reported separately.

PORTS, OF PRINCIPAL COMMODITIES: 1916.

[Tons of 2,000 pounds.]

GRAIN.		IRON ORE.		LUMBER (TONS).		PETROLEUM AND OTHER OILS (TONS).		PIG IRON AND STEEL RAILS.		STONE, SAND, ETC.		MISCELLANEOUS MERCHANDISE.	
Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.
5,969,521	5,969,521	72,614,761	72,614,761	1,629,756	1,629,756	314,959	314,959	184,188	184,188	7,506,452	7,506,452	5,566,498	5,566,498
15,030	5,460	9,238,903		5,652	72	1				1,118,576		3,086	4,706
	4,636,503		12,828,167	11,239	525			3,891		44,300		5,810	
			8,709,166	1,227	260,097	1,549	260	50,056	21,016	9,774	1,033,985	53,203	40,000
				43,094						3,170,144		454,160	273,503
												24,000	
627,128	28,354		8,796,378	1,650	209,006	141,971	559	424	4,760	2,800	1,746,322	289,127	515,418
27,918	42,149		12,289,920		112,462	260	725			18,333	829,974	270,174	119,833
	72		11,084,463					35,328			17,300	10,861	
				2,740			1				8,592	631	1,441
15,217	30,931		434,210		77,527		54,451			79	413,311	265,131	372,117
1,844,910	62,234	39,020,088		447,526	2,429	68	175,409	5,210	41,050	3	428,800	108,755	398,252
	11,544		1,925,743		30,561	73		2,859			25,282	59,445	40,644
3	500	7,975,814		5,165								1,001	1,724
	133,305	3,099,579								59,991	200,142		
804	76,469		1,294	1,664	247,971			1,540	50,773			582,592	717,605
			2,954,438		1,508								520
3,208	3,503			756		35	8,899					276,377	440,824
				20,379	1,230		3,140					5,820	3,561
												84,568	23,928
			1,400,964							969	35,805		
36,815	10,482		927,073	7,048	141	159,931					254,399	133,738	93,497
36,207	170,663		5,124,244	19,230	969						114,647	270	60
	6			18,513	120						800	504,307	235,190
3,906	28	280		110,664	533			49,344	200	1,512	22,994	31,662	7,054
92,256	2,845			212,571	8,557			1,428	369			188,787	178,919
					279				1,103			446,876	398,556
		4,323,740						17,971		52,500		26	
30												163	1,850
184,387	40,690	1,014		89,685	5,186				67			90,032	75,690
			248,513	45,162	25,699		235			6,070		258,516	797,356
359	53,450			164	2,801				3,901			27,913	31,426
	63,204				8,107							24,951	
					2,058					5,333		2,000	22
	5,659	10,507	18,737		5,704							700	36
7,931												15,254	30,929
												9,940	25,321
316	3,191		378,001	4,838	15	61	2			1,000		20,332	38
					5,931							335,693	16,934
												10,560	23,953
												10,831	18,087
	32,691	8,887	2,121,198	456	19,448	11,010			17,971			123,966	20,074
					353,175							38,276	
		11,875,930											224
3,073,096	555,588	159,598	272,675	543,170	51,840		71,248	16,137	40,144	3,015,068	1,528,639	767,301	679,440

The income from passenger traffic was not reported separately in 1889, and it is probable that the number of passengers reported, especially the ferry passengers, was much understated.

In 1916 there were 19,214,076 passengers carried, as compared with 14,079,121 in 1906, an increase of 36.5 per cent. The majority of the passengers, or 69.2 per cent, were ferryboat passengers; the increase between 1906 and 1916 in this class of passengers contributed most of the increase in the total number, as the number of passengers carried on passenger and freight vessels shows an increase of only 1.8 per cent.

The average fare per passenger on passenger and freight vessels increased from 76 cents in 1906 to \$1.05 in 1916, while the average ferry rate decreased from 5.5 cents to 5.1 cents.

RAILWAY CAR FERRIES.

Railroad companies having terminals on Lakes Michigan, Erie, and Ontario and on the St. Lawrence River conduct an extensive car-ferry business as a branch of their railway operations. Table 22 is a comparative statement of principal statistics, so far as available, for car ferries for 1916 and 1906.

TABLE 22.—CAR FERRIES: 1916 AND 1906.

[Craft operated in connection with steam railroads.]

	1916	1906
Number of vessels.....	14	14
Gross tonnage.....	34,268	30,054
Net tonnage.....	21,124	18,252
Horsepower of engines.....	42,180	37,500
Value of vessels.....	\$5,177,068	\$2,799,482
Gross income.....	\$758,945	(1)
Number employed on vessels.....	276	461
Wages.....	\$281,817	\$225,861
Number of passengers carried.....	109,152	390,708

1 Not shown separately.

The increase of railway car-ferry business is indicated by the large gain in value of vessels from \$2,799,482 in 1906 to \$5,177,068 in 1916. There were 14 other vessels reported as owned by railway companies, but these consisted of tugs and scows used principally for building docks, wharves, etc.

EMPLOYEES AND WAGES.

Table 23 presents comparative data in regard to employees and wages, for steam, sail, and unrigged craft, for 1916 and 1906.

TABLE 23.—EMPLOYEES AND WAGES, BY CLASS, WITH PER CENT OF INCREASE: 1916 AND 1906.

CLASS AND CENSUS YEAR.	Number employed on vessels.	Wages.	Average pay per employee.
Total:			
1916.....	26,873	\$18,633,219	\$693
1906.....	24,916	13,280,716	533
Per cent of increase.....	7.9	40.3	30.0
Steam: ¹			
1916.....	24,163	17,027,341	705
1906.....	20,515	11,179,882	545
Per cent of increase.....	17.8	52.3	29.4
Sail:			
1916.....	878	464,581	529
1906.....	2,258	962,542	426
Per cent of increase ²	-61.1	-51.7	24.2
Unrigged:			
1916.....	1,832	1,141,297	623
1906.....	2,143	1,138,292	531
Per cent of increase ²	-14.5	0.3	17.3

¹ Includes craft propelled by machinery.

² A minus sign (—) denotes decrease.

The vessels on the Great Lakes and St. Lawrence River gave employment to 26,873 persons who received a wage of \$18,633,219 in 1916. As compared with 1906, these figures show an increase of 7.9 per cent in number employed and 40.3 per cent in wages.

The steam vessels furnished employment to 89.9 per cent of the persons employed, and these received 91.4 per cent of the wages paid. The average wage per employee increased from \$545 in 1906 to \$705 in 1916.

OWNERSHIP OF VESSELS.

The greater part of the iron ore, coal, and oil of Great Lakes commerce is transported by companies which are subsidiaries of corporations which control the production, sale, and handling of both the raw materials and more or less finished products. A corporation engaged in steel manufacture frequently owns its own Lake Superior mines and ore docks, the fleet which hauls the ore to Lake Erie or lower Lake Michigan, and the furnaces and steel mills in Indiana, Illinois, Ohio, or Pennsylvania which con-

vert the ore into steel ingots, bars, sheets, rails, shapes, and plates for commerce. As a consequence of such coordination of industrial and commercial energies, and likewise because of the large scale on which Great Lakes commerce is organized, vessels operated on the Great Lakes and St. Lawrence River are largely owned by incorporated companies. Table 24 shows, by character of ownership, the number, gross tonnage, and value of the different classes of vessels for 1916 and 1906.

TABLE 24.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CHARACTER OF OWNERSHIP, WITH PER CENT IN EACH CLASS: 1916 AND 1906.

CHARACTER OF OWNERSHIP AND CENSUS YEAR.	VESSELS.		TONNAGE.		VALUE OF VESSELS.	
	Num-ber.	Per cent of total.	Gross tons.	Per cent of total.	Amount.	Per cent of total.
Total:						
1916.....	2,856	100.0	2,737,491	100.0	\$174,765,526	100.0
1906.....	2,990	100.0	2,392,863	100.0	130,805,640	100.0
Individual:						
1916.....	847	29.6	74,383	2.7	6,987,863	4.0
1906.....	975	32.6	204,175	8.5	8,355,470	6.4
Firm:						
1916.....	210	7.4	22,374	0.8	1,275,970	0.7
1906.....	429	14.3	132,836	5.6	4,025,536	3.1
Corporation:						
1916.....	1,747	61.2	2,635,057	96.3	165,083,582	94.5
1906.....	1,536	51.4	2,044,131	85.4	117,310,941	89.7
All other:						
1916.....	52	1.8	5,677	0.2	1,418,111	0.8
1906.....	50	1.7	11,721	0.5	1,113,693	0.9

Corporations controlled 96.3 per cent of the domestic tonnage of the Great Lakes in 1916, representing 94.5 per cent of the total value of lake vessels. Although more than one-fourth of the vessels on the Great Lakes were owned by individuals, their tonnage and value were insignificant in comparison with the figures for incorporated companies.

Table 25 shows, by character of ownership, the number and gross tonnage of the different classes of vessels, according to character of service, for 1916 and 1906.

The most important vessel class, namely, steam freight and passenger vessels, shows an increase of gross tonnage owned by incorporated companies from 1,659,308 tons in 1906 to 2,311,335 in 1916, a ten-year increase of 39.3 per cent. At the same time individual ownership of steam freight and passenger vessels declined from 114,702 tons in 1906 to 23,828 in 1916. Steam tugs and towing vessels and miscellaneous craft were likewise largely operated by incorporated companies, while yachts were chiefly under individual ownership. "All other" ownership includes city and state government craft.

TABLE 25.—NUMBER AND GROSS TONNAGE OF VESSELS, BY CHARACTER OF OWNERSHIP AND BY OCCUPATION: 1916 AND 1906.

CLASS AND OCCUPATION.	TOTAL.				INDIVIDUAL.				FIRM.				INCORPORATED COMPANY.				ALL OTHER.			
	Number of vessels.		Gross tonnage.		Number of vessels.		Gross tonnage.		Number of vessels.		Gross tonnage.		Number of vessels.		Gross tonnage.		Number of vessels.		Gross tonnage.	
	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906
Total.....	2,856	2,990	2,737,491	2,392,863	847	975	74,383	204,175	210	429	22,374	132,836	1,747	1,536	2,635,057	2,044,131	52	50	5,677	11,721
Steam.....	1,153	1,676	2,398,327	1,915,786	161	156	33,642	126,160	77	1207	15,318	71,009	892	1,905	2,345,940	1,714,669	23	28	3,427	13,948
Freight and passenger.....	734	932	2,347,024	1,842,251	59	196	23,828	114,702	30	113	11,729	67,317	644	621	2,311,335	1,659,308	1	2	132	924
Tugs and other towing vessels.....	254	382	19,130	22,663	32	94	1,446	3,592	28	59	1,249	2,326	192	225	16,259	16,446	2	4	176	299
Ferryboats.....	32	48	7,049	35,581	5	12	253	693	7	5	480	137	20	30	6,316	34,721	.....	1	.....	30
Yachts.....	62	236	5,353	6,210	49	204	5,162	5,673	3	23	191	445	.....	6	.....	66	.....	3	.....	26
Miscellaneous.....	81	78	19,771	9,081	16	30	2,953	1,500	9	7	1,669	784	36	23	12,030	4,128	20	18	3,119	2,669
Motor.....	684	.....	12,103	.....	529	.....	9,503	.....	74	.....	1,026	.....	67	.....	1,332	.....	14	.....	242	.....
Freight and passenger.....	176	.....	3,026	.....	132	.....	1,850	.....	25	.....	462	.....	19	.....	714	.....	.....	.....	.....	.....
Tugs and other towing vessels.....	47	.....	460	.....	19	.....	203	.....	7	.....	81	.....	21	.....	176	.....	.....	.....	.....	.....
Ferryboats.....	11	.....	215	.....	7	.....	97	.....	1	.....	9	.....	2	.....	88	.....	1	.....	21	.....
Yachts.....	407	.....	7,771	.....	363	.....	7,279	.....	33	.....	349	.....	10	.....	113	.....	1	.....	30	.....
Miscellaneous.....	43	.....	631	.....	8	.....	74	.....	8	.....	125	.....	15	.....	241	.....	12	.....	191	.....
Sail.....	162	531	145,450	265,571	75	301	14,402	59,578	12	115	2,554	34,900	75	112	128,494	170,267	.....	3	.....	826
Freight and passenger.....	119	403	144,657	263,837	35	199	13,639	58,321	9	90	2,524	34,428	75	112	128,494	170,267	.....	2	.....	821
Yachts.....	42	122	495	1,458	39	97	465	1,170	3	24	30	283	.....	.....	.....	.....	1	.....	.....	5
Miscellaneous.....	1	6	298	.....	1	5	298	87	.....	1	.....	189	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	857	783	181,611	211,506	82	138	16,836	18,437	47	107	3,476	26,927	713	519	159,291	159,195	15	19	2,008	6,947

¹ Includes craft propelled by machinery.

CLASSIFICATION OF VESSELS BY OCCUPATION.

Table 26 classifies lake vessels according to occupation, giving tonnage, value, and gross income for 1916 and 1906.

TABLE 26.—ALL VESSELS, EXCLUSIVE OF FISHING VESSELS, BY OCCUPATION, WITH PER CENT OF INCREASE AND OF TOTAL: 1916 AND 1906.

OCCUPATION AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.
Total:				
1916.....	2,856	2,737,491	\$174,765,526	\$85,095,887
1906.....	2,990	2,392,863	\$130,805,640	\$65,274,702
Freight and passenger:¹				
1916.....	1,029	2,494,707	\$155,296,228	\$76,838,885
1906.....	1,335	2,106,088	\$114,821,511	\$56,850,553
Per cent of increase.....	.....	18.5	35.3	35.2
Tugs and other towing vessels:				
1916.....	301	19,590	\$3,602,554	\$2,523,183
1906.....	382	22,663	\$2,630,097	\$2,474,121
Per cent of increase ².....	.....	-13.6	37.0	2.0
Ferryboats:¹				
1916.....	43	7,264	\$874,675	\$718,215
1906.....	48	35,581	\$3,429,532	\$922,838
Per cent of increase ².....	.....	-79.6	-74.5	-22.2
Yachts:				
1916.....	501	13,619	\$4,237,710	.....
1906.....	358	7,668	\$1,877,850	\$4,494
Per cent of increase.....	.....	77.6	125.7	.....
Miscellaneous:³				
1916.....	982	202,311	\$10,754,359	\$5,015,604
1906.....	857	220,863	\$8,046,650	\$5,022,695
Per cent of increase ².....	.....	-8.4	33.7	-0.1
Per cent of total:				
1916.....	100.0	100.0	100.0	100.0
1906.....	100.0	100.0	100.0	100.0
Freight and passenger:¹				
1916.....	36.0	91.1	88.9	90.3
1906.....	44.6	88.0	87.8	87.1
Tugs and other towing vessels:				
1916.....	10.5	0.7	2.1	3.0
1906.....	12.8	0.9	2.0	3.8
Ferryboats:¹				
1916.....	1.5	0.3	0.5	0.8
1906.....	1.6	1.5	2.6	1.4
Yachts:				
1916.....	17.6	0.5	2.4	.....
1906.....	12.0	0.3	1.4	(4)
Miscellaneous:³				
1916.....	34.4	7.4	6.2	5.9
1906.....	29.0	9.2	6.2	7.7

¹ Car ferries tabulated as freight and passenger in 1916.

² A minus sign (-) denotes decrease.

³ Chiefly barges and other harbor craft.

⁴ Less than one-tenth of 1 per cent.

Of the total tonnage in 1916, 2,494,707, or 91.1 per cent, was reported as the tonnage of 1,029 freight and passenger vessels. The value of these represented 88.9 per cent of the total value of lake carriers and earned 90.3 per cent of the gross income from lake shipping. Tugs and towing vessels, though fewer in number in 1916 than in 1906, show a largely increased investment value, denoting improvement in size and type of vessel. Yachts increased in both number and tonnage, and the value in 1916 was \$4,237,710, as compared with \$1,877,850 in 1906. Miscellaneous vessels, including barges and other harbor craft, show substantial growth in number, tonnage, and value. Decrease in ferries is probably due to the inclusion of some car ferries in the freight and passenger vessel class.

IDLE VESSELS.

Table 27 shows, by the various classes of vessels, the number and gross tonnage of idle craft on the Great Lakes according to the tonnage of the vessels.

TABLE 27.—IDLE CRAFT: 1916.

CLASS.	TOTAL.		LESS THAN 100 TONS.		100 TONS AND OVER.		AVERAGE.		
	Number of vessels.	Gross tons.	Number of vessels.	Gross tons.	Number of vessels.	Gross tons.	Total average.	Less than 100 tons.	100 tons and over.
Total.....	363	62,957	270	6,771	93	56,186	173	25	604
Freight and passenger.....	80	34,175	50	1,287	30	32,888	427	26	1,096
Tugs and other towing vessels.....	37	1,618	34	965	3	653	44	28	218
Ferryboats.....	2	1,547	1	25	1	1,522	774	25	1,522
Fishing vessels.....	75	1,219	74	1,073	1	146	16	15	146
Yachts.....	73	2,343	71	1,790	2	553	32	25	277
Miscellaneous.....	6	273	5	173	1	100	46	35	100
Unrigged.....	90	21,782	35	1,458	55	20,324	242	42	370

The tonnage of idle craft on the Great Lakes is light, 62,957 gross tons in all, representing 363 small vessels of an average of 173 tons per vessel. This item should be taken into consideration in comparisons between census data and that of the Bureau of Navigation, which does not distinguish between active and idle craft.

CHARACTER OF PROPULSION AND HORSEPOWER.

Statistics relating to the rigging of vessels and to the kind of power used are not presented in a special table showing these items, but are included in the statistics shown in Table 32 at the end of this section of the report. Screw propulsion is the rule on lake freight carriers, while side and stern wheel vessels are rapidly disappearing. Of the 2,443, steam and motor vessels reported, 2,407, or 98.5 per cent, were propelled by screw, while only 35 side-wheelers and one stern-wheeler were reported.

The horsepower of the steam and gas engines reported as on vessels of the Great Lakes amounted to 1,089,283, of which 1,052,072 was the horsepower of steam engines and 37,211 that of gasoline engines. Vessels in the freight and passenger service reported 87.8 per cent of the steam horsepower, and the largest amount, or 55.5 per cent, of the gasoline engine power is shown as used by yachts.

CANAL AND RIVER TRAFFIC.

The Census Bureau has no statistics of the Great Lakes transportation as relating specifically to the canals and rivers forming the connecting links between the Lakes. The Corps of Engineers of the United States Army records such data annually, and the following tables are introduced from such reports, showing the growth and volume of Great Lakes commerce. It must be borne in mind in considering the tables that the statistics compiled by the Corps of Engineers are not restricted to American vessels, but relate to the entire commerce of a given harbor or channel; these statistics, however, include only the operations of registered vessels. The Sault Ste. Marie Canal, commonly called the "Soo," handles the commerce passing from Lake Superior, on the one hand, and into Lake Superior from Lakes Erie, Huron, and Michigan, on the other. The Detroit River carries the traffic passing out of Lake Erie, on the one hand, and into Lake Erie from Lakes Superior, Huron, and Michigan, on the other.

Sault Ste. Marie Canals.—Table 28 shows the traffic through the American and Canadian canals at Sault Ste. Marie, Mich., and Ontario, Canada, as compiled by the Corps of Engineers of the United States Army, for each year from 1906 to 1916. The net registered tonnage of the vessels, the total net tons of freight carried, and the quantities of the three principal commodities are given in the table.

TABLE 28.—SAULT STE. MARIE CANAL TRAFFIC: 1906 to 1916.¹

YEAR.	Net registered vessel tonnage.	Total freight (net tons).	EASTBOUND.		WEST-BOUND.
			Iron ore (gross tons).	Wheat (bushels).	Coal (net tons).
1916.....	69,824,463	91,888,219	63,452,107	226,063,315	16,123,119
1915.....	56,399,147	71,290,304	45,213,604	255,481,558	13,357,058
1914.....	41,986,339	55,369,934	31,413,765	150,284,095	14,487,221
1913.....	57,989,715	79,718,344	48,109,353	204,821,507	18,622,938
1912.....	56,736,807	72,472,676	46,303,423	174,086,456	14,931,594
1911.....	41,653,488	53,477,216	30,731,235	97,141,911	15,332,876
1910.....	49,856,123	62,363,218	41,603,634	86,259,974	13,513,727
1909.....	46,751,717	57,895,149	40,014,978	113,253,561	9,940,026
1908.....	31,091,730	41,390,557	24,650,340	106,041,873	9,902,460
1907.....	44,087,974	58,217,214	39,594,944	98,135,775	11,400,095
1906.....	41,098,324	51,751,080	35,357,042	84,271,358	8,739,630

¹ From data compiled and reported by Corps of Engineers, U. S. Army.

Net registered vessel tonnage passing the Sault Ste. Marie Canals increased from 41,098,324 tons in 1906 to 69,824,463 in 1916, a ten-year growth of 69.9 per cent. The total tonnage of freight cargoes, in the same period, increased from 51,751,080 net tons in 1906 to 91,888,219 in 1916, a growth of 77.6 per cent. The largest single freight commodity of lake commerce, iron ore, increased in shipments from Lake Superior from 35,357,042 gross tons in 1906 to 63,452,107 in 1916, or 79.5 per cent. Coal, the largest item of westbound traffic from Lake Erie, increased in tonnage from 8,739,630 net tons in 1906 to 16,123,119 in 1916, or 84.5 per cent. Eastbound wheat shipments, stimulated by the food demands of war, showed a phenomenal increase from 84,271,358 bushels in 1906 to 226,063,315 in 1916, an increase of 168.3 per cent.

According to the report of the Engineer Corps of the Army, the 91,888,219 net tons of freight passing through the "Soo" Canal in 1916 was classified as to source and destination as follows: Eastbound from Lake Superior, 74,148,418 tons, of which 9,646,525 were destined to Lake Michigan, 3,347,314 to Lake Huron, 356,336 to Lake Ontario, and 60,798,243, or 82 per cent of the whole, to Lake Erie; there were 17,739,801 tons of westbound freight destined to Lake Superior, of which 16,632,775, or 93.8 per cent, were from Lake Erie. American vessels carried 69,686,460 tons of the eastbound and 16,487,216 tons of the westbound freight, forming a total of 86,173,676 tons of freight, or 93.8 per cent of the entire commerce.

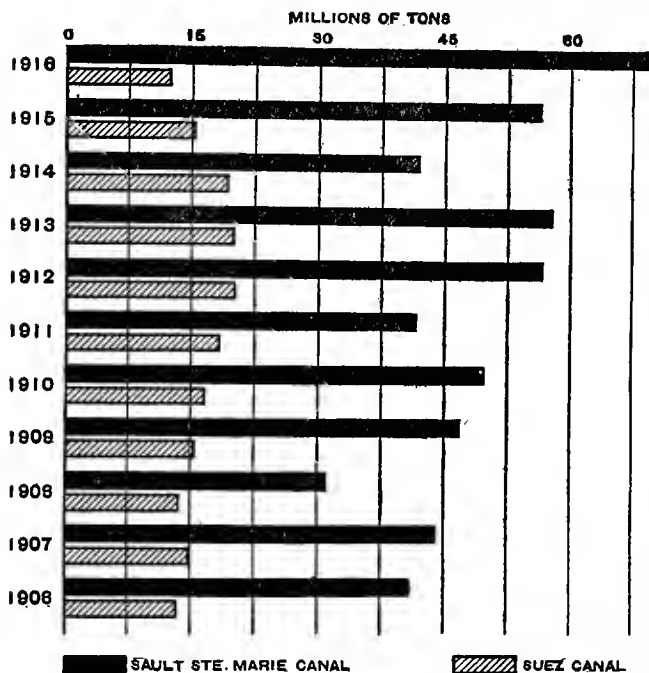
Table 29 is a comparative table showing, for the years from 1906 to 1916, the number of vessel passages and the net registered tonnage of the Sault Ste. Marie Canals and the Suez Canal. These statistics were compiled by the Corps of Engineers, United States Army.

During the 11 years 1906–1916, inclusive, the "Soo" Canals averaged 20,771 vessel passages of 48,861,436 net registered tonnage per annum, as compared with 4,351 vessel passages of 16,311,949 net registered tonnage per annum for the Suez Canal, the Great Lakes Canal link handling approximately three times the volume of vessel traffic exhibited by its Indo-European competitor. In 1916 there were 25,407 vessel passages of 69,824,463 net registered tons at the "Soo," or upwards of five fold that of the Suez.

TABLE 29.—COMPARISON OF TRAFFIC OF THE SAULT STE. MARIE AND SUEZ CANALS: 1906 TO 1916.¹

YEAR.	VESSEL PASSAGES.		NET REGISTERED TONS.	
	Sault Ste. Marie Canals.	Suez Canal.	Sault Ste. Marie Canals.	Suez Canal.
Total.....	228, 479	47, 856	537, 475, 827	179, 431, 441
1916.....	25, 407	3, 110	69, 824, 463	12, 325, 347
1915.....	21, 233	3, 708	56, 399, 147	15, 266, 155
1914.....	18, 717	4, 802	41, 986, 339	19, 409, 495
1913.....	23, 795	5, 085	57, 989, 715	20, 033, 884
1912.....	22, 778	5, 373	56, 736, 807	20, 275, 120
1911.....	18, 673	4, 969	41, 653, 488	18, 324, 794
1910.....	20, 899	4, 533	49, 856, 123	16, 581, 898
1909.....	19, 204	4, 239	46, 751, 717	15, 407, 527
1908.....	15, 181	3, 795	31, 091, 730	13, 633, 283
1907.....	20, 437	4, 267	44, 087, 971	14, 728, 434
1906.....	22, 155	3, 975	41, 098, 324	13, 445, 504
Average per year.....	20, 771	4, 351	48, 861, 436	16, 311, 949

¹ Prepared from reports of the Corps of Engineers, U. S. Army, and the reports of British Suez Canal Directors.

DIAGRAM 5.—NET TONNAGE PASSING THROUGH THE SAULT STE. MARIE AND THE SUEZ CANALS: 1906 TO 1916.

Detroit River traffic.—Table 30 shows the number of vessel passages, the net registered tons, and the estimated net tons of freight passing through the Detroit River for each year from 1906 to 1916.

TABLE 30.—COMMERCE PASSING THROUGH THE DETROIT RIVER: 1906 TO 1916.¹

YEAR.	Number of vessel passages.	Net registered tonnage of vessels.	Estimated tons of freight.
1916.....	37, 852	76, 677, 264	100, 907, 279
1915.....	34, 823	65, 280, 425	82, 514, 457
1914.....	31, 913	52, 927, 106	69, 810, 853
1913.....	37, 473	62, 092, 149	85, 376, 705
1912.....	33, 675	61, 606, 271	78, 671, 208
1911.....	30, 612	52, 142, 703	66, 951, 231
1910.....	33, 638	58, 821, 282	73, 526, 602
1909.....	32, 296	51, 668, 846	67, 789, 369
1908.....	27, 883	40, 628, 850	54, 086, 750
1907.....	34, 149	53, 959, 769	71, 226, 895
1906.....	35, 128	50, 673, 897	63, 808, 571

¹ Compiled from official records of Corps of Engineers, U. S. Army.

Net registered vessel tonnage passing through Detroit River increased from 50,673,897 tons in 1906 to 76,677,264 in 1916, an increase for the ten-year period of 51.3 per cent; the aggregate freight cargoes increased from 63,808,571 net tons in 1906 to 100,907,279 in 1916, an increase of 58.1 per cent. The greater percentage of ten-year growth in the traffic of the "Soo" Canal than in that of Detroit River is chiefly accounted for by the fact that Lake Superior iron ore constitutes over one-half of the aggregate freight volume of Great Lakes commerce, and that most of the Lake Superior iron ore shipments passing the "Soo" goes to Gary, Hammond, and South Chicago, at the foot of Lake Michigan, instead of through Detroit River to the furnaces and steel mills in the vicinity of Lake Erie.

DULUTH-SUPERIOR.

The port of Duluth-Superior, located at the head of the Great Lakes system, as previously stated in this report, was the source of a greater tonnage of water-borne freight shipments than any other port in the United States, although in receipts New York, Chicago, Buffalo, and Cleveland outrank Duluth-Superior. The 41,131,478 net tons recorded by the Corps of Engineers, United States Army, as the freight shipments of Duluth-Superior in 1916 exceed those of any two of the above cities combined. The net registered vessel tonnage recorded for Duluth-Superior in 1916 was 42,194,633 tons, compared with 25,157,576 in 1906, a ten-year increase of 67.7 per cent. Freight shipments of 41,131,478 net tons in 1916 compared with 23,023,507 in 1906 show a ten-year growth of 78.6 per cent. Iron ore, wheat, flour, and lumber constitute the principal commodities shipped from Duluth-Superior Harbor, while coal and general merchandise make up the principal lake tonnage received.

TABLE 31.—COMMERCE OF DULUTH-SUPERIOR HARBOR: 1906-1916.¹

YEAR.	VESSELS ENTERING AND DEPARTING.		FREIGHT (NET TONS).	
	Number.	Net registered tonnage.	Receipts.	Shipments.
1916.....	12, 445	42, 194, 633	11, 045, 855	41, 131, 487
1915.....	10, 764	34, 257, 227	9, 713, 245	30, 781, 427
1914.....	9, 712	28, 216, 139	10, 616, 482	22, 919, 212
1913.....	11, 925	35, 982, 013	12, 165, 608	34, 709, 808
1912.....	11, 846	37, 400, 820	9, 705, 999	31, 768, 777
1911.....	9, 638	33, 578, 209	9, 424, 962	21, 247, 884
1910.....	11, 571	32, 695, 284	9, 520, 990	27, 163, 588
1909.....	10, 503	28, 372, 175	6, 815, 410	25, 743, 891
1908.....	7, 992	19, 038, 664	6, 594, 915	17, 202, 247
1907.....	10, 736	27, 767, 099	7, 840, 023	26, 946, 682
1906.....	11, 185	25, 157, 576	6, 147, 714	23, 023, 507

¹ From data compiled by Corps of Engineers, U. S. Army.

Table 32 shows in detail for all vessels, including fishing vessels, the principal statistics of transportation on the Great Lakes and St. Lawrence River, in 1916, by character of ownership and class of service.

TABLE 32.—ALL VESSELS, BY CLASS,

	CLASS, OCCUPATION, AND OWNERSHIP.	Number of vessels.	TONNAGE.		RIGGED.			Horsepower of engines.	CONSTRUCTION.		
			Gross.	Net.	Screw.	Side-wheel.	Stern-wheel.		Metal.	Wood.	Composite.
1	Aggregate.....	3,462	2,747,687	2,118,718	2,407	35	1	1,089,283	867	2,562	33
2	STEAM.....	1,362	2,404,763	1,800,567	1,328	34		(Steam.) 1,052,072	705	633	24
3	Freight and passenger.....	734	2,347,024	1,764,620	704	30		924,068	516	199	19
4	Tugs and other towing vessels.....	254	19,130	10,750	254			55,563	98	154	2
5	Ferryboats.....	32	7,049	4,278	31	1		14,505	10	22	
6	Fishing.....	209	6,436	4,210	209			15,702	33	176	
7	Yachts.....	52	5,353	3,500	51	1		17,839	19	32	1
8	Miscellaneous.....	81	19,771	13,209	79	2		24,395	29	50	2
9	Individual.....	252	36,235	26,065	248	4		48,977	33	211	3
10	Freight and passenger.....	59	23,523	17,676	58	1		16,744	7	50	2
11	Tugs and other towing vessels.....	32	1,446	753	32			5,038	3	29	
12	Ferryboats.....	5	253	184	5			350	2	3	
13	Fishing.....	91	2,598	1,662	91			6,999	7	84	
14	Yachts.....	49	5,162	3,396	48	1		17,161	13	30	1
15	Miscellaneous.....	16	2,953	2,394	14	2		2,685	1	15	
16	Firm.....	150	17,565	12,631	150			24,658	19	130	1
17	Freight and passenger.....	30	11,729	8,833	30			10,161	3	26	1
18	Tugs and other towing vessels.....	28	1,249	742	28			6,479	4	24	
19	Ferryboats.....	7	480	324	7			899	1	6	
20	Fishing.....	73	2,247	1,502	73			5,091	10	63	
21	Yachts.....	3	101	104	3			678	1	2	
22	Miscellaneous.....	9	1,669	1,126	9			1,350		9	
23	Incorporated company.....	927	2,347,536	1,760,266	907	30		967,386	633	285	19
24	Freight and passenger.....	644	2,311,335	1,738,014	615	29		897,063	506	122	16
25	Tugs and other towing vessels.....	192	16,259	9,145	192			43,586	89	101	2
26	Ferryboats.....	20	6,316	3,770	19	1		13,256	7	13	
27	Fishing.....	45	1,596	1,046	45			3,612	16	29	
28	Yachts.....										
29	Miscellaneous.....	36	12,030	8,291	36			9,869	15	20	1
30	All other ownership.....	23	3,427	1,605	23			11,051	15	7	1
31	Freight and passenger.....	1	132	97	1			100			
32	Tugs and other towing vessels.....	2	176	110	2			460	2	1	
33	Ferryboats.....										
34	Fishing.....										
35	Yachts.....										
36	Miscellaneous.....	20	3,119	1,398	20			10,491	13	6	1
37	MOTOR.....	1,081	15,863	12,875	1,079	1	1	(Gas.) 37,211	20	1,057	4
38	Freight and passenger.....	176	3,026	2,444	176			5,749	1	174	1
39	Tugs and other towing vessels.....	47	460	372	46		1	1,402	1	46	
40	Ferryboats.....	11	215	170	11			346	1	10	
41	Fishing.....	397	3,760	3,303	397			7,412	2	393	2
42	Yachts.....	407	7,771	6,078	406	1		20,654	10	396	1
43	Miscellaneous.....	43	631	508	43			1,648	5	38	
44	Individual.....	809	12,071	9,741	808	1		29,648	14	792	3
45	Freight and passenger.....	132	1,850	1,506	132			4,083		131	1
46	Tugs and other towing vessels.....	19	203	160	19			621	1	18	
47	Ferryboats.....	7	97	63	7			218		7	
48	Fishing.....	280	2,568	2,266	280			4,875	1	278	1
49	Yachts.....	363	7,279	5,686	362	1		19,556	10	352	1
50	Miscellaneous.....	8	74	60	8			295	2	6	
51	Firm.....	153	1,835	1,513	152		1	3,745	3	150	
52	Freight and passenger.....	25	462	259	25			870	1	24	
53	Tugs and other towing vessels.....	7	81	63	6		1	234		7	
54	Ferryboats.....	1	9	8	1			20		1	
55	Fishing.....	79	809	721	79			1,575	1	78	
56	Yachts.....	33	349	276	33			820		33	
57	Miscellaneous.....	8	125	86	8			226	1	7	
58	Incorporated company.....	104	1,703	1,411	104			3,099	3	100	1
59	Freight and passenger.....	19	714	579	19			796		19	
60	Tugs and other towing vessels.....	21	176	149	21			547		21	
61	Ferryboats.....	2	88	81	2			90	1	1	
62	Fishing.....	37	371	305	37			934		36	1
63	Yachts.....	10	113	91	10			273		10	
64	Miscellaneous.....	15	241	206	15			459	2	13	
65	All other ownership.....	15	254	210	15			719		15	
66	Freight and passenger.....										
67	Tugs and other towing vessels.....										
68	Ferryboats.....	1	21	18	1			18		1	
69	Fishing.....	1	12	11	1			28		1	
70	Yachts.....	1	30	25	1			5		1	
71	Miscellaneous.....	12	191	156	12			668		12	

Value of vessels.	INCOME.				Number employed on vessels.	Wages.	Number of passengers carried.	Freight carried (tons of 2,000 pounds).	
	Total.	Freight.	Passenger.	All other.					
\$175,956,392	\$87,225,376	\$70,382,512	\$6,881,689	\$9,961,175	28,680	\$19,582,781	19,249,692	125,385,545	1
160,533,324	80,455,254	67,475,839	6,745,437	6,233,978	24,502	17,323,290	18,319,876	122,396,430	2
150,694,478	75,001,244	67,464,452	6,072,032	1,464,760	20,757	14,438,201	5,231,864	122,394,454	3
3,513,445	2,458,159	500	1,600	2,456,059	1,354	1,163,248	4,815	150	4
842,225	705,323	5,917	671,505	27,901	254	181,474	13,081,997	689	5
825,643	1,335,195	4,065	300	1,330,830	1,070	667,516	1,200	1,137	6
2,178,295					334	173,721			7
2,479,238	955,333	905		954,428	693	709,130			8
4,481,405	1,772,800	772,315	83,207	917,278	1,524	858,165	888,909	833,045	9
1,620,400	864,215	769,345	51,421	43,449	499	279,831	312,049	831,963	10
219,900	166,921	500	1,500	164,921	141	83,844	3,315	150	11
41,500	30,286	200	29,986	100	28	8,201	572,345		12
283,800	540,303	2,270	300	537,733	440	248,565	1,200	932	13
2,133,295					323	172,596			14
182,510	171,075			171,075	93	65,128			15
1,250,140	1,418,446	493,073	63,063	862,310	890	562,717	478,136	363,176	16
562,500	566,832	490,010	35,943	40,879	310	185,264	102,530	362,871	17
186,517	113,226			193,226	106	74,283			18
62,448	34,018	363	27,120	6,535	26	15,986	375,606	100	19
287,675	531,693	1,795		529,898	363	241,348		205	20
45,000					11	1,125			21
106,000	92,677	905		91,772	74	44,711			22
153,572,669	77,222,323	66,194,451	6,599,167	4,428,705	21,819	15,536,294	16,952,331	121,200,209	23
148,503,578	73,554,197	66,189,097	5,984,668	1,380,432	19,937	13,959,568	4,817,285	121,199,620	24
3,057,028	2,072,327		100	2,072,227	1,095	993,670	1,000		25
738,277	641,019	5,354	614,399	21,266	240	157,287	12,134,046	589	26
254,168	263,199			263,199	267	167,603			27
1,019,618	691,581			691,581	280	258,166			28
1,229,110	41,685	16,000		25,685	269	366,114	500		30
8,000	16,000	16,000			11	13,538			31
50,000	25,685			25,685	12	11,451	500		32
									33
									34
1,171,110					246	341,125			35
2,913,897	1,179,540	88,088	136,252	955,200	1,468	653,613	929,816	45,778	37
323,613	234,331	86,980	118,798	28,553	265	82,431	691,442	45,412	38
89,109	65,024		495	64,529	50	24,056	1,990		39
32,450	12,892		12,675	217	18	5,271	208,773		40
365,223	794,294	1,108	2,384	790,802	737	292,046	16,811	366	41
1,989,265					326	182			

TABLE 32.—ALL VESSELS, BY CLASS,

	CLASS, OCCUPATION, AND OWNERSHIP.	Number of vessels.	TONNAGE.		RIGGED.			Horsepower of engines.	CONSTRUCTION.		
			Gross.	Net.	Screw.	Side-wheel.	Stern-wheel.		Metal.	Wood.	Composite.
1	SAIL.....	162	145,450	137,087					25	137	
2	Freight and passenger.....	119	144,657	136,372					25	94	
3	Yachts.....	42	495	432						42	
4	Miscellaneous.....	1	298	283						1	
5	Individual.....	75	14,402	13,559						75	
6	Freight and passenger.....	35	13,639	12,874						35	
7	Yachts.....	39	465	402						39	
8	Miscellaneous.....	1	298	283						1	
9	Firm.....	12	2,554	2,436						12	
10	Freight and passenger.....	9	2,624	2,406						9	
11	Yachts.....	3	30	30						3	
12	Miscellaneous.....										
13	Incorporated company.....	75	128,494	121,092					25	50	
14	Freight and passenger.....	75	128,494	121,092					25	50	
15	Yachts.....										
16	Miscellaneous.....										
17	All other ownership.....										
18	Freight and passenger.....										
19	Yachts.....										
20	Miscellaneous.....										
21	UNRIGGED, miscellaneous.....	857	181,611	168,189					117	735	5
22	Individual, miscellaneous.....	82	16,836	16,251					5	77	
23	Firm, miscellaneous.....	47	3,476	3,263					1	46	
24	Incorporated company, miscellaneous.....	713	159,291	146,667					110	598	5
25	All other ownership, miscellaneous.....	15	2,008	2,008					1	14	

¹ Includes 1,503 tons of freight handled by fishing vessels. The statistics of fishing vessels are not included in the comparative tables of this report.

OCCUPATION, AND OWNERSHIP: 1916—Continued.

Value of vessels.	INCOME.				Number employed on vessels.	Wages.	Number of passengers carried.	Freight carried (tons of 2,000 pounds).	
	Total.	Freight.	Passenger.	All other.					
\$4,351,287	\$1,611,810	\$1,592,510	.....	\$19,300	878	\$464,581	.....	1,730,990	1
4,278,137	1,603,310	1,592,510	.....	10,800	856	456,096	.....	1,730,990	2
70,150	.....	.....	.....	.....	17	5,425	.....	.....	3
3,000	8,500	.....	.....	8,500	5	3,060	.....	.....	4
289,900	403,505	384,342	.....	19,163	209	101,877	.....	271,685	5
201,950	395,005	384,342	.....	10,663	188	93,542	.....	271,685	6
64,950	.....	.....	.....	.....	16	5,275	.....	.....	7
3,000	8,500	.....	.....	8,500	5	3,060	.....	.....	8
40,000	93,589	93,552	.....	37	46	27,035	.....	56,511	9
34,800	93,589	93,552	.....	37	45	26,885	.....	56,511	10
5,200	.....	.....	.....	.....	1	150	.....	.....	11
.....	.....	.....	.....	.....	.....	.....	.....	.....	12
4,041,387	1,114,716	1,114,616	.....	100	623	335,669	.....	1,402,794	13
4,041,387	1,114,716	1,114,616	.....	100	623	335,669	.....	1,402,794	14
.....	.....	.....	.....	.....	.....	.....	.....	.....	15
.....	.....	.....	.....	.....	.....	.....	.....	.....	16
.....	.....	.....	.....	.....	.....	.....	.....	.....	17
.....	.....	.....	.....	.....	.....	.....	.....	.....	18
.....	.....	.....	.....	.....	.....	.....	.....	.....	19
.....	.....	.....	.....	.....	.....	.....	.....	.....	20
8,157,884	3,978,772	1,226,075	.....	2,752,697	1,832	1,141,297	.....	1,212,347	21
333,668	321,108	182,437	.....	138,671	235	105,315	.....	116,947	22
119,505	109,442	35,364	.....	74,078	89	37,026	.....	27,632	23
7,554,542	3,430,932	1,008,274	.....	2,422,658	1,432	966,737	.....	1,067,768	24
150,169	117,290	.....	.....	117,290	76	32,219	.....	.....	25

MISSISSIPPI RIVER AND ITS TRIBUTARIES

MISSISSIPPI RIVER AND ITS TRIBUTARIES.

By STORY B. LADD.

SCOPE OF THE REPORT.

This section of the report on transportation by water presents the statistics for the year ending December 31, 1916, for all water craft of 5 tons or over net register operated on the waters of the Mississippi River and its tributaries. The statistics for the operations of craft on other waters are treated in the various sections of this report, designated as Atlantic Coast and Gulf of Mexico; the Pacific Coast (including Alaska); the Great Lakes and St. Lawrence River; and Canals and other inland waters. The last-named division includes certain waters of the Mississippi Valley not connected by open navigation with the Mississippi River, such as Big Stone, Leech, and Minnetonka Lakes in Minnesota, Buffalo Lake and Wolf River in Wisconsin, and Caddo Lake in Louisiana. Certain waters included under "Canals and other inland waters" are the Red River (of the North), which flows north into Lake Winnipeg, and its tributaries, Traverse Lake and Red Lake of Minnesota; and Rainey River, Rainey Lake and Vermillion Lake, Minnesota, tributaries of the Great Lakes.

The statistics for the Mississippi River and its tributaries are grouped under three heads, designated as the Upper Mississippi, the Lower Mississippi, and the Ohio systems, these classifications conforming to those used at the censuses of 1906 and 1889. The statistics of freight shipments and receipts are shown for the leading ports and the principal streams, each stream being credited with the freight that had its origin thereon or was received at its ports or landings.

The tributaries of the Upper Mississippi system in the order of their importance as conveyors of freight in 1916 are the Missouri, Illinois, Osage, Gasconade, St. Croix, and Rock. The Osage and Gasconade are branches of the Missouri, and the statistics therefor are in some of the tables combined with those for the Missouri.

Of the Ohio system, the tributaries for which data can be separately reported are, according to freight rank, the Monongahela, Kanawha, Tennessee, Cumberland, Green, Little Kanawha, Kentucky, Wabash, Muskingum, Allegheny, Big Sandy, and Middle Island Creek; and of the Lower Mississippi system, the Yazoo, White, Sunflower—a branch of the Yazoo—Ouachita,

Arkansas, Black of Arkansas, Red, St. Francis, Bayou Lafourche, Hatchie, Atchafalaya, L'Anguille, Tensas, and Macon Bayou.

St. Louis has been taken as the point of separation between the Upper and Lower Mississippi River systems, freight to or from ports below St. Louis being credited to the Lower Mississippi and to or from ports above St. Louis to the Upper Mississippi. The local traffic at St. Louis is included in the Lower Mississippi system. With respect to Cairo, Ill., the Ohio system has received credit for freight pertaining to the Ohio River or any of its tributaries, and the Lower Mississippi system credit for freight below Cairo.

The traffic reported for a specific stream includes that on all branches thereof unless otherwise stated.

The line of separation between traffic of the Mississippi River and the Gulf of Mexico is made at Port Eads. All local traffic between New Orleans and Port Eads and on the bayous of Louisiana tributary to the Mississippi are included in this section of the report. But ocean and gulf traffic to or from New Orleans and traffic on Lake Pontchartrain and its tributaries and on Grand Lake and the gulf outlets to the bayous and rivers of lower Louisiana are included in the Atlantic Coast and Gulf section.

In cases where boats operated upon several streams, as on the Tennessee, Ohio, and Mississippi Rivers, and the traffic could not be distributed, it has been assigned to the waters of the home port, or the port showing the bulk of the freight shipments.

GENERAL SUMMARY.

This is the third comprehensive census of all water craft and of transportation by water. The first covered the year 1889 and the second, 1906. The census of 1880 took cognizance of steam craft only and of freight carried by the barge lines of St. Louis and the coal barges of Pittsburgh. Hence comparative statistics are confined to those for 1889, 1906, and 1916, representing intervals of 17 years and 10 years, respectively.

There will be found in the report on Transportation Business in the United States, Eleventh Census, 1890, Part II—Transportation by Water—a review of early transportation on the rivers of the Mississippi Valley.

Table 1 gives the general statistics for 1916, 1906, and 1889 for all vessels and craft except fishing vessels,

which are excluded from all comparative tables in this report. For census purposes the classification designated "Steam" in all tables unless otherwise stated includes all vessels equipped with machinery for propelling power, whether using steam or internal-combus-

tion engines. No sail or electric motor vessels of 5 tons net register or over were reported for this division. The unrigged class includes all craft without motive power of their own, such as barges, flats, scows, lighters and dredges, derricks, etc.

TABLE 1.—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916, 1906, AND 1889.

	TOTAL.			STEAM. ¹			UNRIGGED.		
	1916	1906 ²	1889	1916	1906	1889	1916	1906	1889
Number of vessels.....	7,239	9,622	7,300	1,700	1,435	972	5,539	8,187	6,328
Gross tonnage.....	1,821,495	4,411,967	3,364,610	119,963	146,227	192,974	1,501,532	4,265,740	3,171,636
Value of vessels.....	\$23,030,503	\$22,852,142	\$14,407,162	\$13,143,054	\$13,196,770	\$9,622,608	\$9,887,449	\$9,655,372	\$4,784,554
Gross income.....	\$17,439,746	\$17,342,038	\$16,331,672	\$11,502,672	\$15,410,136	(3)	\$5,937,074	\$1,981,902	(3)
Number employed on vessels.....	14,706	15,016	15,951	12,509	13,973	(3)	2,197	1,043	(3)
Wages.....	\$6,380,325	\$5,692,117	\$5,337,185	\$5,091,681	\$5,148,581	(3)	\$1,288,644	\$543,536	(3)
Number of passengers carried.....	17,599,378	14,122,241	10,858,894	16,596,431	13,890,850	(3)	1,002,947	231,391	(3)
Freight and harbor work (tons of 2,000 pounds).....	440,169,427	31,626,981	29,401,409	7,992,998	6,787,994	10,345,504	32,176,429	24,838,987	19,055,905
Freight carried.....	27,962,583	26,436,690	28,289,503	7,992,998	6,787,994	10,345,504	19,969,585	19,648,696	17,943,996
Harbor work.....	12,206,844	5,190,291	1,111,906				12,206,844	5,190,291	1,111,909

¹ Includes craft propelled by machinery (no sail vessels reported for this division).

² Not including 14 boats of 653 gross tons for which detailed statistics are not available.

³ Figure not available.

⁴ Includes 12,332,713 tons of freight transferred by railway car ferries.

⁵ Includes 6,905,597 tons of freight transferred by railway car ferries.

The vessels propelled by machinery, although showing an increase in number for each year, decreased in tonnage, due to an increase in the number of motor craft which had small average tonnage. In 1916, of the 1,700 vessels propelled by machinery, 635, or 37.4 per cent, were steam vessels averaging 162 gross tons and 1,065, or 62.6 per cent, were motor boats averaging 16 tons, whereas in 1906 the proportions were opposite, 61.6 per cent being steam vessels of an average of 158 tons and 38.4 per cent motor craft of an average of 11 tons.

The most marked change is in unrigged craft. The figures show a very large decrease in number and tonnage for 1916 as compared with 1906, due chiefly to the decrease in the number and tonnage of coal barges in the fleets of the big Pittsburgh companies operated on the Ohio.

Formerly the boats in service or many of them were barges built for a single-tow river trip, and after discharging at New Orleans or other lower river ports they were sold for lumber. This practice, due to the absence of return freight and the expense of returning the boats, has been to a great extent discontinued. In 1906 the unrigged craft reported averaged over 500 gross tons, with an average value per boat of \$1,179, a unit ton value of \$2.26, whereas in 1916, though the average tonnage per boat was but 271 tons, the average value per boat was \$1,785, or a unit ton value of \$6.58.

Table 2 gives the per cent of increase of the several statistical items for the census periods.

TABLE 2.—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS, PER CENT OF INCREASE: 1889-1916 AND 1906-1916.

	PER CENT OF INCREASE. ¹					
	Total.		Steam. ²		Unrigged.	
	1906-1916	1889-1916	1906-1916	1889-1916	1906-1916	1889-1916
Number of vessels.....	-24.8	-0.8	18.5	74.9	-32.3	-12.5
Gross tonnage.....	-63.2	-51.8	-18.0	-37.8	-64.8	-52.7
Value of vessels.....	0.8	59.9	-0.4	36.6	2.4	106.7
Gross income.....	0.6	6.8	-25.4	.....	207.3	.....
Number employed on vessels.....	-2.1	-7.8	-10.5	.....	110.6	.....
Wages.....	12.1	19.5	-1.1	.....	137.1	.....
Number of passengers carried.....	24.6	62.1	19.5	.....	333.4	.....
Freight and harbor work (tons of 2,000 pounds).....	27.0	36.6	17.8	-22.7	29.5	68.9
Freight carried.....	5.8	-1.2	17.8	-22.7	1.6	11.3
Harbor work.....	135.2	997.8	.....	.....	135.2	997.8

¹ A minus sign (-) denotes decrease.

² Includes craft propelled by machinery.

DIAGRAM 1.—GROSS TONNAGE OF ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916, 1906, AND 1889.

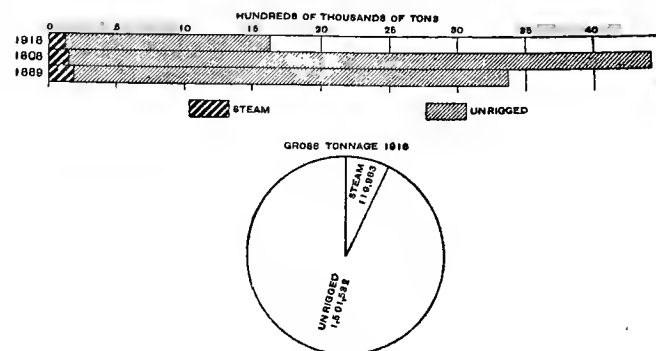
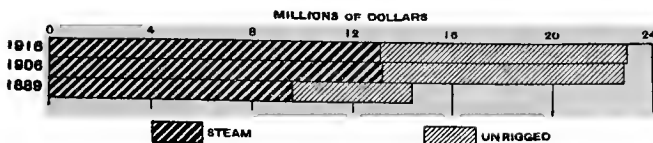


DIAGRAM 2.—VALUE OF ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916, 1906, AND 1889.



VALUE OF VESSELS 1916

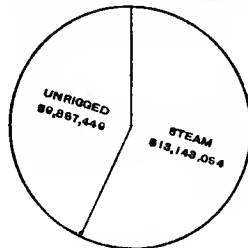
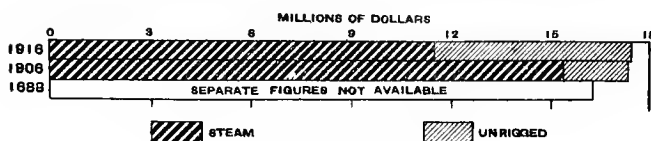
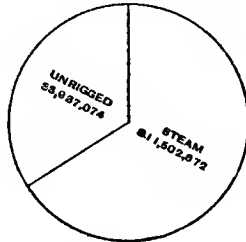


DIAGRAM 3.—GROSS INCOME OF ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916, 1906, AND 1889.



GROSS INCOME 1916



Census of 1880.—Table 3 gives the general statistics as reported at the census of 1880. This census was confined to the Merchant Steam Marine and covered steam vessels and the unrigged craft operated in conjunction therewith, represented by the barge lines of St. Louis and the coal barge traffic of Pittsburgh. Consequently, the statistics are not shown in comparison with those for later censuses.

TABLE 3.—MERCHANT STEAM MARINE: RIVERS OF THE MISSISSIPPI VALLEY—CENSUS OF 1880.¹

	Number or amount.		Number or amount.
Number of vessels.....	5,052	Steam vessels, by occupation.	
Steam.....	1,198	Passenger and freight, number.....	508
Unrigged.....	3,854	Gross tonnage.....	166,376
Gross tonnage.....	1,161,617	Value.....	\$7,059,900
Steam.....	251,793	Ferryboats, number.....	177
Unrigged.....	909,824	Gross tonnage.....	21,307
Value of vessels.....	\$16,379,400	Value.....	\$1,022,900
Steam.....	\$12,009,400	Towing and harbor vessels, number.....	477
Unrigged.....	\$4,370,000	Gross tonnage.....	63,225
Gross income.....	\$20,293,173	Value.....	\$3,800,500
Number of employees (ordinary crew).....	23,616	Miscellaneous, number.....	41
Wages.....	\$6,979,226	Gross tonnage.....	885
Number of passengers carried.....	6,728,067	Value.....	\$126,100
Freight moved (net tons).....	18,946,522		
Steam.....	13,557,884		
Unrigged.....	5,388,638		

¹ From report on Transportation on the Rivers of the Mississippi Valley for the Eleventh Census, pp. 448 and 449.

Table 4 gives the general statistics for the United States and for the Mississippi River and its tributaries for 1916, 1906, and 1889, and shows for the several items the proportion that the Mississippi River and its tributaries formed of the total for the United States for each year.

TABLE 4.—ALL VESSELS AND CRAFT OPERATED IN THE UNITED STATES AND ON THE MISSISSIPPI RIVER AND ITS TRIBUTARIES SEPARATELY, WITH PER CENT THOSE OPERATED ON THE MISSISSIPPI RIVER AND ITS TRIBUTARIES FORM OF THE TOTAL FOR THE UNITED STATES: 1916, 1906, AND 1889.

	UNITED STATES.			MISSISSIPPI RIVER AND ITS TRIBUTARIES.			PER CENT MISSISSIPPI RIVER AND ITS TRIBUTARIES FORM OF THE TOTAL FOR UNITED STATES.		
	1916	1906	1889	1916	1906	1889	1916	1906	1889
Number of vessels.....	37,894	37,321	30,485	7,239	9,622	7,300	19.1	25.8	23.9
Gross tonnage.....	12,249,990	12,893,429	8,359,135	1,621,495	4,411,967	3,364,610	13.2	34.2	40.3
Value of vessels.....	\$959,925,364	\$507,973,121	\$206,992,352	\$23,030,503	\$22,852,142	\$14,407,162	2.4	4.5	7.0
Gross income.....	\$563,736,367	\$294,854,532	\$161,994,066	\$17,439,746	\$17,342,038	\$16,331,872	3.1	5.9	10.1
Number employed on vessels.....	153,301	140,929	113,870	14,706	15,016	15,951	9.6	10.7	14.0
Wages.....	\$103,235,534	\$71,636,521	\$41,482,812	\$6,380,325	\$5,692,117	\$5,337,185	6.2	7.9	12.8
Number of passengers carried.....	331,590,565	366,825,663	198,992,438	17,599,378	14,122,241	10,858,894	5.3	3.8	5.5
Freight and harbor work (tons of 2,000 pounds).....	381,352,926	265,545,804	129,851,658	40,169,427	31,628,981	29,401,409	10.5	11.9	22.6
Freight carried.....	258,002,611	177,519,758	(¹)	27,962,583	26,436,690	28,289,503	10.8	14.9	.....
Harbor work.....	123,350,315	88,026,046	(¹)	12,206,844	5,190,291	1,111,906	9.9	5.9	.....

¹ Figures not available.

In general the growth of water commerce on the Mississippi and its tributaries has not kept pace with the growth for all waters combined. For every statistical item of the table, with the exception of number of passengers carried and tons of harbor work, the proportion the Mississippi River and its tributaries formed of the total was less in 1916 than in 1906,

and, with the exception of number of vessels, less in 1906 than in 1889.

Table 5 gives, for 1916 and 1906, the number and gross tonnage of vessels, by class, for the United States and for the Mississippi River and its tributaries, with the proportion that the Mississippi River and its tributaries formed of the total for the United States.

TABLE 5.—NUMBER AND GROSS TONNAGE OF ALL VESSELS AND CRAFT OPERATED IN THE UNITED STATES AND ON THE MISSISSIPPI RIVER AND ITS TRIBUTARIES SEPARATELY, BY OCCUPATION, WITH PER CENT THOSE ON THE MISSISSIPPI RIVER AND ITS TRIBUTARIES FORM OF TOTAL FOR THE UNITED STATES: 1916, 1906, AND 1889.

CLASS.	UNITED STATES.				MISSISSIPPI RIVER AND ITS TRIBUTARIES.				PER CENT MISSISSIPPI RIVER AND ITS TRIBUTARIES FORM OF THE TOTAL FOR UNITED STATES.			
	Number.		Gross tonnage.		Number.		Gross tonnage.		Number.		Gross tonnage.	
	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906
	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906
Total.....	37,894	37,321	12,249,990	12,893,429	7,239	9,622	1,621,495	4,411,967	19.1	25.8	13.2	34.2
Commercial vessels.....	32,330	32,674	12,058,424	12,736,529	6,877	9,362	1,611,262	4,406,535	21.3	28.7	13.4	34.6
Freight and passenger.....	7,696	8,796	6,506,910	5,084,450	389	390	48,602	55,779	5.1	4.4	0.7	1.1
Ferryboats.....	611	536	224,328	261,073	213	166	11,263	22,180	34.9	31.0	5.0	8.5
Tugs and other towing vessels.....	3,689	3,079	264,135	261,375	736	619	49,865	62,836	19.1	20.1	18.9	24.0
Unrigged craft.....	20,334	20,263	5,063,051	7,129,631	5,539	8,187	1,501,532	4,265,740	27.2	40.4	29.7	59.8
Yachts.....	4,354	3,770	123,007	106,430	325	222	6,429	3,255	7.5	5.9	5.2	3.1
Miscellaneous.....	1,210	877	68,559	50,470	37	38	3,804	2,177	3.1	4.3	5.5	4.3
Steam vessels ²	14,581	9,927	6,097,562	4,059,521	1,700	1,435	119,963	146,227	11.7	14.5	2.0	3.6
Sail vessels.....	2,979	7,131	1,089,377	1,704,277								

¹ Includes 14 railway transfers which in 1916 were classified as freight and passenger vessels.

² Includes craft propelled by machinery.

The statistics in this report are treated under the following heads:

1. *Construction*.—The vessels are classified by character of construction, whether wood, metal, or composite, that is, of iron or steel frame with wooden sheathing and decks, and the several groups are classified according to character of service. These data are comparative for 1916 and 1906 and are confined to number, gross tonnage, and value.

2. *Propulsion*.—This classification relates to vessels propelled by machinery, whether stern wheel, side wheel, or screw. Paddle wheels largely predominated, and particularly stern wheels. The several groups are subdivided according to character of service. The data given are comparative for 1916 and 1906 and relate to number and gross tonnage.

3. *Kind of power used*.—This classification, relating also to machinery propelled vessels, is according to the character of the power used, whether steam, gasoline, or other power, with subclassifications according to character of service, and is comparative for 1916 and 1906.

4. *Size*.—This classification is for all vessels and is according to tonnage, the groups being vessels of less than 50 tons gross register, 50 but less than 100, 100 to 199, 200 to 299, 300 to 399, 400 to 499, 500 to 999, and 1,000 tons and over.

5. *Ownership*.—Under this heading are presented the statistics for number, gross tonnage, and value of all vessels for 1916 and 1906, classified according to character of ownership, with subdivisions for steam vessels and unrigged vessels.

6. *Employees and salaries and wages*.—These statistics relate to the number employed on vessels and the number employed on land incident to the operation of the vessels, with salaries and wages, for 1916 and 1906, and with subdivisions according to character of service.

7. *Income*.—The statistics for income from passengers, freight, and all other sources, 1916 and 1906, are given by class of vessels.

8. *Freight*.—The statistics for freight show the tonnage handled by water craft in 1916 and 1906, classified by commodities, by ports, by rivers and river systems, and by boat classes, whether on steamers or on towed barges; also the tonnage lightered and that handled by railway car transfers.

9. *Passengers*.—The statistics for passenger traffic are classified by rivers and river systems and by ferryboats and other vessels.

10. *Ferryboats*.—The general statistics for ferryboats are comparative for 1916, 1906, and 1889 and are given in detail for 1916 and 1906 by river systems and districts.

11. *Other classes of statistics*.—Detail statistics are also given for yachts, work boats, railway shipping, Government vessels, fishing craft and idle craft for 1916 and 1906.

CONSTRUCTION.

Table 6 presents the statistics for number, gross tonnage, and value of all craft classified according to material of construction and character of service or occupation for 1916 and 1906.

TABLE 6.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CHARACTER OF CONSTRUCTION AND BY CLASS AND OCCUPATION: 1916 AND 1906.

CLASS AND OCCUPATION.	Cen- sus year.	TOTAL.			WOOD.			METAL.			COMPOSITE.		
		Num- ber.	Gross tonnage.	Value.	Num- ber.	Gross tonnage.	Value.	Num- ber.	Gross tonnage.	Value.	Num- ber.	Gross tonnage.	Value.
Aggregate	1916	7,239	1,621,495	\$23,030,503	6,796	1,502,966	\$16,370,993	411	116,112	\$6,392,750	32	2,417	\$266,760
	1906	9,622	4,411,967	22,852,142	9,513	4,377,480	20,213,460	107	33,893	2,580,682	2	594	58,000
Steam ¹	1916	1,700	119,963	13,143,054	1,554	92,263	8,923,172	132	26,243	3,973,882	14	1,457	246,000
	1906	1,435	146,227	13,196,770	1,358	129,141	10,870,593	75	16,492	2,268,177	2	594	58,000
Freight and passenger	1916	389	48,602	4,531,749	358	38,362	2,963,223	30	10,018	1,543,526	1	222	25,000
	1906	390	55,779	8,737,450	379	52,692	3,407,950	10	2,962	321,500	1	125	8,000
Tugs and other towing vessels	1916	736	49,865	5,917,111	668	39,843	4,138,755	60	9,120	1,596,356	8	902	182,000
	1906	619	62,536	6,822,210	578	55,881	5,571,777	40	6,486	1,200,433	1	469	50,000
Ferryboats	1916	213	11,263	1,014,950	192	6,316	614,900	18	4,875	393,550	3	72	6,500
	1906	166	22,180	1,776,360	153	15,604	1,156,616	13	6,576	619,744			
Yachts	1916	325	6,429	1,206,153	304	4,942	848,203	20	1,480	356,450	1	7	1,500
	1906	222	3,255	563,400	211	2,887	471,900	11	368	91,500			
Miscellaneous	1916	37	3,804	473,091	32	2,800	358,091	4	750	84,000	1	254	31,000
	1906	38	2,177	297,350	37	2,077	262,350	1	100	35,000			
Unrigged	1916	5,539	1,501,532	9,887,449	5,242	1,410,703	7,447,821	279	89,869	2,418,868	18	960	20,760
	1906	8,187	4,265,740	9,655,372	8,155	4,248,339	9,342,867	32	17,401	312,505			

¹ Includes craft propelled by machinery.

The per cent distribution of the number, tonnage, and value as between wooden vessels and metal and composite vessels is given in Table 7 for all vessels and for vessels of various classes, these percentages being based upon the data given in Table 6.

TABLE 7.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CHARACTER OF CONSTRUCTION AND BY CLASS AND OCCUPATION. PER CENT OF TOTAL: 1916 AND 1906.

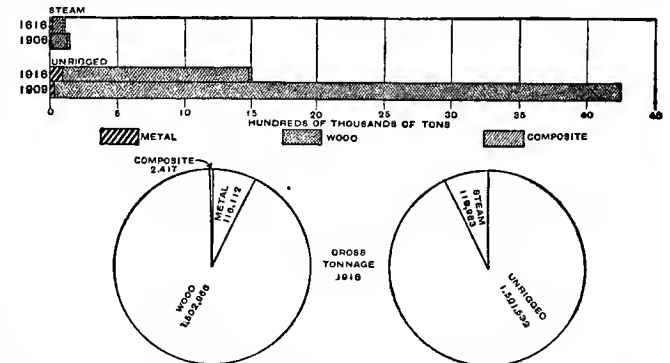
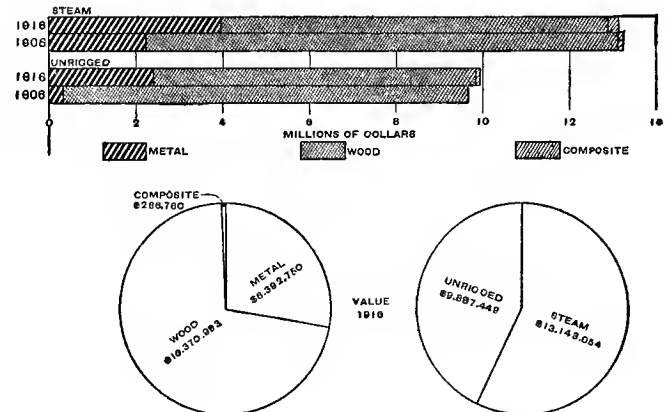
CLASS, OCCUPATION, AND CENSUS YEAR.	NUMBER.		GROSS TONNAGE.		VALUE.	
	Wood.	Metal and com- posite.	Wood.	Metal and com- posite.	Wood.	Metal and com- posite.
Aggregate:						
1916	93.9	6.1	92.7	7.3	71.1	28.9
1906	98.9	1.1	99.2	0.8	88.5	11.5
Steam: ¹						
1916	91.4	8.6	76.9	23.1	67.9	32.1
1906	94.7	5.3	83.3	11.7	82.4	17.6
Freight and passenger:						
1916	92.0	8.0	78.9	21.1	65.4	34.6
1906	97.2	2.8	94.5	5.5	91.2	8.8
Tugs and other towing vessels:						
1916	90.8	9.2	79.9	20.1	70.0	30.0
1906	93.4	6.6	88.9	11.1	82.7	18.3
Ferryboats:						
1916	90.1	9.9	56.1	43.9	60.6	39.4
1906	92.2	7.8	70.4	29.6	65.1	34.9
Yachts:						
1916	93.5	6.5	76.9	23.1	70.3	29.7
1906	95.0	5.0	88.7	11.3	83.8	16.2
Miscellaneous:						
1916	86.5	13.5	73.6	26.4	75.7	24.3
1906	97.3	2.7	95.4	4.6	88.2	11.8
Unrigged:						
1916	94.6	5.4	94.0	6.0	75.3	24.7
1906	99.6	0.4	99.6	0.4	96.8	3.2

¹ Includes craft propelled by machinery.

A notable feature is the proportionate increase in metal and composite vessels.

Metal vessels constituted 5.7 per cent in number and 7.2 per cent in tonnage of all craft in 1916, as compared with 1.1 per cent in number and eight-tenths of 1 per cent in tonnage in 1906, and composite vessels, although not numerous, show proportionately a very large in-

crease. The increase in number of metal vessels during the period 1906 to 1916 was at the rate of 284.1 per cent, while wooden craft show a decrease in number of 28.6 per cent, in gross tonnage of 65.7 per cent, and in value of 19 per cent. At the census of 1889 the character of construction was not reported.

DIAGRAM 4.—GROSS TONNAGE OF STEAM AND UNRIGGED VESSELS, BY CHARACTER OF CONSTRUCTION: 1916 AND 1906.**DIAGRAM 5.—VALUE OF STEAM AND UNRIGGED VESSELS, BY CHARACTER OF CONSTRUCTION: 1916 AND 1906.**

PROPULSION AND POWER.

Table 8 gives for 1916 and 1906 the number and gross tonnage of all steam craft, classified according to means of propulsion—stern wheel, side wheel, and screw.

The flat-bottomed stern wheeler is the prevailing type of steamboat on the Mississippi. The designation as here used refers to paddle-wheel boats with the wheel at the stern. Stern-wheel vessels constituted 59.7 per cent of the number of all steam vessels in 1916 and 63.5 per cent of the tonnage, as compared with 69 per cent of the number and 74.1 per cent of the tonnage in 1906; and paddle-wheel craft of the various types—stern wheel, side wheel, and center wheel—constituted 64.4 per cent in number of all

steam craft and 85.5 per cent in tonnage in 1916, as compared with 75.2 per cent in number and 94 per cent in tonnage in 1906. Included in the side-wheel group there was one center-wheel in 1916 and four in 1906. These are catamarans, with the paddle wheel mounted in the center between the two hulls, and are employed in ferry service. There is a relatively large increase in number and tonnage of screw propellers, the same pertaining to freight and passenger vessels; towboats, and yachts, but this increase is essentially due to the growing use of small motor vessels. The paddle-wheel craft averaged approximately 94 tons in 1916 and 127 tons in 1906, as compared with 29 tons in 1916 and 25 in 1906 for screw propellers as a whole.

TABLE 8.—NUMBER AND GROSS TONNAGE OF VESSELS PROPELLED BY MACHINERY, BY CHARACTER OF PROPULSION AND BY OCCUPATION, WITH PER CENT OF TOTAL: 1916 AND 1906.

OCCUPATION.	Census year.	TOTAL.		STERN WHEEL.		SIDE WHEEL. ¹		SCREW.		PER CENT OF TOTAL.					
										Stern wheel.		Side wheel.		Screw.	
		Num-ber.	Gross ton-nage.	Num-ber.	Gross ton-nage.	Num-ber.	Gross ton-nage.	Num-ber.	Gross ton-nage.	Num-ber.	Gross ton-nage.	Num-ber.	Gross ton-nage.	Num-ber.	Gross ton-nage.
Total.....	1916 1906	1,700 1,435	119,963 146,227	1,015 990	76,144 108,405	80 89	26,405 28,988	605 356	17,414 8,834	59.7 60.0	63.5 74.1	4.7 6.2	22.0 19.8	35.6 24.8	14.5 6.0
Freight and passenger.....	1916 1906	389 390	48,602 55,779	222 287	24,168 39,447	39 36	20,424 15,280	128 67	4,010 1,052	57.1 73.6	49.7 70.7	10.0 9.2	42.0 27.4	32.9 17.2	8.3 1.9
Tugs and other towing vessels.....	1916 1906	736 619	49,865 62,836	567 506	41,663 57,213	10 7	561 174	159 106	7,641 5,449	77.0 81.7	83.6 91.1	1.4 1.1	1.1 0.3	21.6 17.1	15.3 8.7
Ferryboats.....	1916 1906	213 166	11,263 22,180	146 105	6,016 8,257	23 39	4,744 13,214	44 22	503 709	68.5 63.3	53.4 37.2	10.8 23.5	42.1 59.6	20.7 13.3	4.5 3.2
Yachts.....	1916 1906	325 222	6,429 3,255	52 70	1,383 1,774	6 6	62 96	267 146	4,984 1,385	16.0 31.5	21.5 54.5	1.8 2.7	1.0 2.9	82.2 65.8	77.5 42.5
Miscellaneous.....	1916 1906	37 38	3,804 2,177	28 22	2,914 1,714	2 1	614 224	7 15	276 239	75.7 57.9	76.6 78.7	5.4 2.6	16.1 10.3	18.9 39.5	7.3 11.0

¹ Includes center-wheel catamaran ferryboats, 1 of 89 gross tons in 1916 and 4 of 616 gross tons in 1906.

Table 9 gives the statistics for machinery propelled vessels with respect to the character of the propelling equipment, whether steam or motor, the latter being

all gasoline motor boats. No vessels or boats of 5 tons net register or over equipped with electric motors were reported.

TABLE 9.—NUMBER, GROSS TONNAGE, AND HORSEPOWER OF VESSELS PROPELLED BY MACHINERY, BY OCCUPATION, WITH PER CENT OF TOTAL: 1916 AND 1906.

OCCUPATION.	Census year.	TOTAL.			STEAM.			MOTOR.			PER CENT OF TOTAL.					
											Steam.			Motor.		
		Num-ber.	Gross tonnage.	Horse-power.	Num-ber.	Gross tonnage.	Horse-power.	Num-ber.	Gross tonnage.	Horse-power.	Num-ber.	Gross tonnage.	Horse-power.	Num-ber.	Gross tonnage.	Horse-power.
Total.....	1916 1906	1,700 1,435	119,963 146,227	219,434 236,969	635 884	103,105 139,965	189,314 227,802	1,065 551	16,858 6,262	30,120 9,167	37.4 61.6	85.9 95.7	86.3 96.1	62.6 38.4	14.1 4.3	13.7 3.9
Freight and passenger.....	1916 1906	389 390	48,602 55,779	68,290 80,692	162 259	43,162 54,092	61,507 78,451	227 131	5,440 1,687	6,783 2,241	41.6 66.4	88.8 97.0	90.1 97.2	58.4 33.6	11.2 3.0	9.9 2.8
Tugs and other towing vessels.....	1916 1906	736 619	49,865 62,836	115,681 117,547	362 454	45,339 61,100	106,212 114,696	374 165	4,526 1,736	9,469 2,851	49.2 73.3	90.9 97.2	91.8 97.6	50.8 26.7	9.1 2.8	8.2 2.4
Ferryboats.....	1916 1906	213 166	11,263 22,180	14,685 28,220	71 117	9,155 21,321	12,142 27,372	142 49	2,108 859	2,543 848	33.3 70.5	81.3 96.1	82.7 97.0	66.7 29.5	18.7 3.9	17.3 3.0
Yachts.....	1916 1906	325 222	6,429 3,255	14,515 6,542	12 34	1,941 1,425	3,566 3,571	313 188	4,488 1,830	10,949 2,971	3.7 15.3	30.2 43.8	24.6 54.6	96.3 84.7	69.8 56.2	75.4 45.4
Miscellaneous.....	1916 1906	37 38	3,804 2,177	6,263 3,968	28 20	3,508 2,027	5,887 3,712	9 18	296 150	376 256	75.7 52.6	92.2 93.1	94.0 93.5	24.3 47.4	7.8 6.9	6.0 6.5

Motor vessels formed 62.6 per cent of the number of all vessels propelled by machinery in 1916, as compared with 38.4 per cent in 1906, and of the tonnage 14.1 per cent in 1916, as compared with 4.3 per cent in 1906. An increase in number, tonnage, and horsepower appears for all classes of motor boats except number in the miscellaneous class.

Included in the motor group there are six vessels of

82 gross tons equipped with kerosene motors and one of 6 gross tons with an alco-vapor motor.

Table 10 is a summary of the number, gross tonnage, and horsepower of the vessels propelled by machinery in service in 1916 and 1906, classified by character of power and by character of propulsion, with the per cent distribution as between steam and motor for the several classes.

TABLE 10.—NUMBER, GROSS TONNAGE, AND HORSEPOWER OF VESSELS PROPELLED BY MACHINERY, BY KIND OF POWER AND CHARACTER OF PROPULSION, WITH PER CENT OF TOTAL: 1916 AND 1906.

	Census year.	CHARACTER OF PROPULSION.				PER CENT OF TOTAL.			
		All vessels.	Stern wheel.	Side wheel.	Screw.	All vessels.	Stern wheel.	Side wheel.	Screw.
Number.....	1916	1,700	1,015	80	605	100.0	100.0	100.0	100.0
	1906	1,435	990	89	356	100.0	100.0	100.0	100.0
Steam.....	1916	635	479	52	104	37.4	47.2	65.0	17.2
	1906	884	678	76	130	61.6	68.5	85.4	36.5
Motor.....	1916	1,065	536	28	501	62.6	52.8	35.0	82.8
	1906	551	312	13	226	38.4	31.5	14.6	63.5
Gross tonnage.....	1916	119,963	76,144	26,405	17,414	100.0	100.0	100.0	100.0
	1906	146,227	108,405	28,988	8,834	100.0	100.0	100.0	100.0
Steam.....	1916	103,105	68,057	25,892	9,156	85.9	89.4	98.1	52.6
	1906	139,965	104,476	28,837	6,652	95.7	96.4	99.5	75.3
Motor.....	1916	16,858	8,087	513	8,258	14.1	10.6	1.9	47.4
	1906	6,262	3,929	151	2,182	4.3	3.6	0.5	24.7
Horsepower.....	1916	219,434	137,093	35,289	47,052	100.0	100.0	100.0	100.0
	1906	236,969	174,121	40,424	22,424	100.0	100.0	100.0	100.0
Steam.....	1916	189,314	124,853	34,685	29,776	86.3	91.1	98.3	63.3
	1906	227,802	169,210	40,266	18,326	96.1	97.2	99.6	81.7
Motor.....	1916	30,120	12,240	604	17,276	13.7	8.9	1.7	36.7
	1906	9,167	4,911	158	4,098	3.9	2.8	0.4	18.3

TONNAGE OF VESSELS.

The distribution of all craft and of steam, motor, and unrigged vessels by tonnage groups is given in Table 11.

There is a large number of small gasoline boats in service, but the census does not take cognizance of boats under 5 tons net register. Those within the scope of the census are of small tonnage, only 34

boats of 50 tons or more being reported in 1916 and 9 in 1906. The returns for 1916 include 1 gasoline motor vessel of 264 tons and 1 of 1,473 tons, the former being a pleasure yacht on the lower Mississippi and the latter a freighter plying between St. Louis and New Orleans. Excluding these, the motor vessels show an average of 14 gross tons in 1916 and 11 in 1906.

TABLE 11.—VESSELS GROUPED ACCORDING TO GROSS TONNAGE: 1916 AND 1906.

TONNAGE GROUPS.	TOTAL.		STEAM.		MOTOR.		UNRIGGED.	
	1916	1906	1916	1906	1916	1906	1916	1906
All vessels:								
Number.....	7,239	9,622	635	884	1,065	551	5,539	8,187
Gross tonnage.....	1,621,495	4,411,967	103,105	139,965	16,858	6,262	1,501,532	4,265,740
5 to 49 tons:								
Number.....	1,971	1,383	166	246	1,031	542	774	595
Gross tonnage.....	32,942	31,759	5,003	6,763	12,863	5,583	15,076	19,413
50 to 99 tons:								
Number.....	792	682	226	256	32	9	534	417
Gross tonnage.....	56,422	48,654	17,659	19,312	2,258	679	36,505	28,663
100 to 199 tons:								
Number.....	1,605	1,912	110	183	.....	.....	1,495	1,729
Gross tonnage.....	227,239	295,536	16,960	26,898	.....	.....	210,279	268,638
200 to 299 tons:								
Number.....	849	784	50	76	1	.....	798	708
Gross tonnage.....	203,743	196,099	12,153	18,839	264	.....	191,321	177,260
300 to 399 tons:								
Number.....	333	105	20	39	.....	.....	313	66
Gross tonnage.....	109,878	34,990	7,092	13,893	.....	.....	102,786	21,097
400 to 499 tons:								
Number.....	436	424	12	21	.....	.....	424	403
Gross tonnage.....	196,567	181,044	5,510	9,482	.....	.....	191,037	171,562
500 to 999 tons:								
Number.....	1,092	2,087	43	56	.....	.....	1,049	2,031
Gross tonnage.....	627,783	1,215,430	27,866	34,824	.....	.....	599,917	1,180,606
1,000 tons and over:								
Number.....	161	2,245	8	7	1	.....	152	2,238
Gross tonnage.....	166,921	2,408,455	10,857	9,954	1,473	.....	154,591	2,398,501

In the class of steam vessels the largest number is found in the group of "50 to 99 tons" in both 1916 and 1906, although the group of "500 to 999 tons" has the largest tonnage. In the class of motor vessels the group of "5 to 49 tons" contains the majority both as to number and tonnage. In the unrigged class the group "100 to 199 tons" shows the largest number of vessels in 1916, 27 per cent of the total number, and the group "500 to 999 tons" the next largest number, the same constituting 18.9 per cent of the total number, but the latter group contains 40 per cent of the tonnage and the former but 14 per cent. In 1906 the group of "1,000 tons and over" led in

both number and tonnage, with 27.3 per cent of the former and 56 per cent of the latter, followed by the group of "500 to 999 tons" with 24.8 per cent of the total number and 27.7 per cent of the tonnage.

OWNERSHIP.

Table 12 presents the statistics for number, gross tonnage, and value of all vessels in service in 1916 and 1906 by character of ownership and like data for steam craft engaged in freight and passenger traffic, for tugs and other towing vessels, ferryboats, yachts, and other steam vessels classed as miscellaneous, and for unrigged craft.

TABLE 12.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CLASS, OWNERSHIP, AND OCCUPATION, WITH PER CENT OF TOTAL: 1916 AND 1906.

CLASS, OWNERSHIP, AND OCCUPATION.	Census year.	Number.	Gross tonnage.	Value.	PER CENT OF TOTAL.		
					Number.	Gross tonnage.	Value.
Total.....	1916 1906	7,239 9,622	1,621,495 4,411,967	\$23,030,503 22,852,142	100.0 100.0	100.0 100.0	100.0 100.0
Individual.....	1916 1906	1,852 1,318	182,084 134,655	4,340,014 3,114,755	25.6 13.7	11.2 3.1	18.8 13.6
Firm.....	1916 1906	616 533	46,418 49,346	1,554,122 1,341,901	8.5 5.5	2.9 1.1	6.7 5.9
Incorporated company.....	1916 1906	4,731 7,752	1,390,915 4,226,600	16,704,919 18,292,186	65.4 80.6	85.8 95.8	72.5 80.0
All other.....	1916 1906	40 19	2,078 1,366	431,448 103,300	0.5 0.2	(1) (1)	1.9 0.5
Steam ²	1916 1906	1,700 1,435	119,963 146,227	13,143,054 13,196,770	100.0 100.0	100.0 100.0	100.0 100.0
Individual.....	1916 1906	861 687	22,952 27,524	2,932,565 2,394,680	50.6 47.9	19.1 18.8	22.3 18.1
Firm.....	1916 1906	245 211	8,828 11,360	1,018,227 935,875	14.4 14.7	7.4 7.8	7.7 7.1
Incorporated company.....	1916 1906	573 524	86,949 106,575	8,979,104 9,783,915	33.7 36.5	72.5 72.9	68.3 74.1
All other.....	1916 1906	21 13	1,234 768	213,158 82,300	1.2 0.9	1.0 0.5	1.6 0.6
Freight and passenger.....	1916 1906	389 390	48,602 55,779	4,531,749 3,737,450	100.0 100.0	100.0 100.0	100.0 100.0
Individual.....	1916 1906	198 179	6,712 11,472	651,470 778,125	50.9 45.9	13.8 20.6	14.4 20.8
Incorporated company.....	1916 1906	130 139	38,317 38,243	3,465,879 2,550,925	33.4 35.6	78.8 68.6	76.5 68.3
Firm and all other.....	1916 1906	61 72	3,573 6,064	414,400 408,400	15.7 18.5	7.4 10.9	9.1 10.9
Tugs and other towing vessels.....	1916 1906	736 619	49,885 62,836	5,917,111 6,822,210	100.0 100.0	100.0 100.0	100.0 100.0
Individual.....	1916 1906	281 232	8,178 10,441	944,605 847,405	38.2 37.5	16.4 16.6	16.0 12.4
Incorporated company.....	1916 1906	352 298	38,187 48,351	4,554,341 5,559,980	47.8 48.1	76.6 76.9	77.0 81.5
Firm and all other.....	1916 1906	103 89	3,500 4,044	418,165 414,825	14.0 14.4	7.0 6.4	7.1 6.1
Ferryboats.....	1916 1906	213 166	11,263 22,180	1,014,950 1,776,360	100.0 100.0	100.0 100.0	100.0 100.0
Individual.....	1916 1906	109 73	2,264 2,349	227,100 206,100	51.2 44.0	20.1 10.6	22.4 11.6
Incorporated company.....	1916 1906	61 65	8,082 18,403	697,350 1,477,310	28.6 39.2	71.8 83.0	68.7 83.2
Firm and all other.....	1916 1906	43 28	917 1,428	90,500 92,950	20.2 16.9	8.1 6.4	8.9 5.2
Yachts.....	1916 1906	325 222	6,429 3,255	1,206,153 563,400	100.0 100.0	100.0 100.0	100.0 100.0
Individual.....	1916 1906	267 185	5,334 2,815	1,022,883 502,450	82.2 83.3	83.0 86.5	84.8 89.2
Incorporated company.....	1916 1906	10 7	401 206	41,700 18,150	3.1 3.2	6.2 6.4	3.5 3.2
Firm and all other.....	1916 1906	48 30	694 234	141,570 42,800	14.8 13.5	10.8 7.2	11.7 7.6

¹ Less than one-tenth of 1 per cent.

² Includes craft propelled by machinery.

TABLE 12.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CLASS, OWNERSHIP, AND OCCUPATION, WITH PER CENT OF TOTAL: 1916 AND 1906—Continued.

CLASS, OWNERSHIP, AND OCCUPATION.	Census year.	Number.	Gross tonnage.	Value.	PER CENT OF TOTAL.		
					Number.	Gross tonnage.	Value.
Steam ¹ —Continued.							
Miscellaneous.....	1916	37	3,804	\$473,091	100.0	100.0	100.0
	1906	38	2,177	297,350	100.0	100.0	100.0
Individual.....	1916	6	464	86,507	16.2	12.2	18.3
	1906	18	447	60,600	47.4	20.5	20.4
Incorporated company.....	1916	20	1,962	219,834	54.1	51.6	46.5
	1906	15	1,372	177,550	39.5	63.0	59.7
Firm and all other.....	1916	11	1,378	166,750	29.7	36.2	35.2
	1906	5	358	59,200	13.2	16.4	19.9
Unrigged.....	1916	5,539	1,501,532	9,887,449	100.0	100.0	100.0
	1906	8,187	4,265,740	9,655,372	100.0	100.0	100.0
Individual.....	1916	991	159,132	1,407,449	17.9	10.6	14.2
	1906	631	107,131	720,075	7.7	2.5	7.5
Firm.....	1916	371	37,590	555,895	6.7	2.5	5.4
	1906	322	37,986	406,026	3.9	0.9	4.2
Incorporated company.....	1916	4,158	1,303,966	7,725,815	75.1	86.8	78.1
	1906	7,228	4,120,025	8,508,271	88.3	96.6	88.1
All other.....	1916	19	844	218,290	0.3	(²)	2.2
	1906	6	598	21,000	0.1	(²)	0.2

¹ Includes craft propelled by machinery.² Less than one-tenth of 1 per cent.

Although the bulk of the water craft on the Mississippi River and its tributaries was owned by corporations and the proportion of all craft represented by corporate ownership was greater in this division than in the other divisions, yet a marked decrease is shown for 1916 as compared with 1906. Vessels owned by corporations formed 65.4 per cent of the total number of vessels, 85.8 per cent of the tonnage, and 72.5 per cent of the total value in 1916, as compared with 80.6 per cent, 95.8 per cent, and 80 per cent, respectively, in 1906. Of course in the class of yachts and pleasure craft individual ownership predominated. Corporate ownership controlled 86.8 per cent of the tonnage of unrigged vessels in 1916, as compared with 96.6 per cent in 1906, the decrease being primarily due to the decrease in the coal barges of the Pittsburgh district.

Table 13 shows the extent of ownership concentration in 1916 and 1906.

With respect to unrigged vessels, 73.9 per cent in 1916 were owned by 77 owners, each of whom reported 10 vessels or more, and 41.5 per cent of the total number were owned by 10 owners, each of whom reported 100 vessels or more. In 1906 there were 68 owners of the 10 and over class, representing 86.7 per cent of all unrigged boats, and 10 owners of the 100 and over class, with 67.3 per cent of the total number of boats.

The figures as given in the table for freight and passenger vessels, tugs, and ferryboats show that relatively few of the owners controlled 3 or more vessels.

TABLE 13.—OWNERSHIP CONCENTRATION: 1916 AND 1906.

	NUMBER OF OWNERS.		NUMBER OF VESSELS.		GROSS TONNAGE.		PER CENT OF INCREASE. ¹	
	1916	1906	1916	1906	1916	1906	Number of vessels.	Gross tonnage.
Steam: ²								
Freight and passenger—								
All owners.....			389	390	48,602	55,779	—0.3	—12.9
Owners reporting 3 or more vessels.....	16	20	61	84	14,661	28,142		—47.9
Tugs and other towing vessels—								
All owners.....			736	619	49,865	62,836	18.9	—20.6
Owners reporting 3 or more vessels.....	23	12	142	131	27,169	32,609	8.4	—16.7
Ferryboats—								
All owners.....			213	166	11,263	22,180	28.3	—49.2
Owners reporting 3 or more vessels.....	5	4	16	21	2,925	5,699		—48.7
Unrigged:								
All owners.....			5,539	8,187	1,501,532	4,265,740	—32.3	—64.8
Owners reporting—								
Less than 10 vessels.....			1,448	1,089	173,506	138,346	33.0	25.4
10 but less than 100 vessels.....	67	58	1,794	1,592	417,123	723,412	12.7	—42.3
100 vessels or more.....	10	10	2,297	5,506	910,903	3,403,982	—58.3	—73.2

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.² Includes craft propelled by machinery.**EMPLOYEES AND SALARIES AND WAGES.**

Table 14 presents the statistics for 1916 and 1906 of the number of employees on vessels and on land, the amounts paid in salaries and wages for the different classes of vessels, and percentages of increase.

TABLE 14.—EMPLOYEES AND SALARIES AND WAGES, BY OCCUPATION OF VESSEL, WITH PER CENT OF INCREASE: 1916 AND 1906.

OCCUPATION.	1916		1906		PER CENT OF INCREASE. ¹	
	Number of employees.	Salaries and wages.	Number of employees.	Salaries and wages.	Number of employees.	Salaries and wages.
Total.....	16,678	\$7,449,710	17,473	\$7,063,776	- 4.5	5.5
On vessels.....	14,706	6,380,325	15,016	5,692,117	- 2.1	12.1
On land.....	1,972	1,069,385	2,457	1,371,659	-19.7	-22.0
Officers, managers, clerks, etc.....	769	596,649	1,011	686,536	-23.9	-13.1
All other.....	1,203	472,736	1,446	685,123	-16.8	-31.0
Freight and passenger vessels.....	4,755	2,423,113	7,333	2,335,977	-35.2	3.7
On vessels.....	4,091	2,123,755	6,746	2,019,202	-39.4	5.2
On land.....	664	299,358	587	316,775	13.1	- 5.5
Officers, managers, clerks, etc.....	330	222,895	296	219,828	11.5	1.4
All other.....	334	76,463	291	96,947	14.8	-21.1
Towing vessels and unrigged craft.....	10,387	4,163,760	8,668	3,926,242	19.8	6.0
On vessels.....	9,558	3,589,653	7,152	3,055,644	33.6	17.5
On land.....	829	574,107	1,516	870,598	-45.3	-34.1
Officers, managers, clerks, etc.....	341	316,564	560	364,366	-39.1	-13.1
All other.....	488	257,543	956	506,232	-49.0	-49.1
Ferryboats.....	721	397,224	838	493,961	-14.0	-19.6
On vessels.....	572	346,116	699	413,553	-18.2	-16.3
On land.....	149	51,108	139	80,408	7.2	-36.4
Officers, managers, clerks, etc.....	71	34,521	120	72,192	-40.8	-52.2
All other.....	78	16,587	19	8,216	310.5	101.9
All other, including yachts.....	815	465,613	634	307,596	28.5	51.4
On vessels.....	485	320,801	419	203,713	15.8	57.5
On land.....	330	144,812	215	103,878	53.5	39.4
Officers, managers, clerks, etc.....	27	22,669	35	30,150	-22.9	-24.8
All other.....	303	122,143	180	73,728	68.3	65.7

¹ A minus sign (-) denotes decrease.

The greater part of the decrease in number of employees is in the land force and chiefly in the class of towing and unrigged vessels. The employees reported for towing vessels and unrigged craft increased materially, while those for freight and passenger vessels decreased, the former constituting 62.3 per cent of all employees in 1916 and the latter 28.5 per cent, as compared with 49.6 per cent for the former and 42 per cent for the latter in 1906.

INCOME.

Table 15 is a comparative presentation of the income statistics for 1916 and 1906, by class of vessels.

TABLE 15.—GROSS INCOME OF ALL VESSELS AND CRAFT, BY SOURCE OF INCOME AND BY OCCUPATION OF VESSEL, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916 AND 1906.

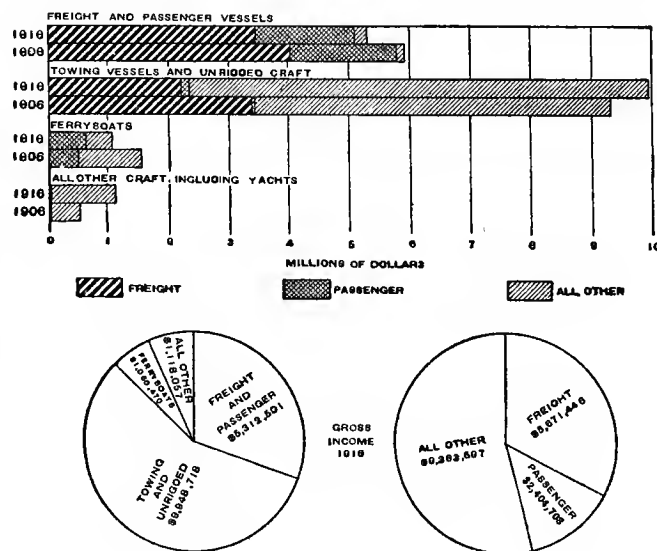
SOURCE OF INCOME.	INCOME.		Per cent of increase: ¹ 1906-1916.	PER CENT OF TOTAL.	
	1916	1906		1916	1906
Total.....	\$17,439,746	\$17,342,038	0.6	100.0	100.0
Freight.....	5,671,446	7,450,869	-23.9	32.5	43.0
Passengers.....	2,404,703	2,281,243	5.4	13.8	13.1
All other sources.....	9,363,597	7,609,926	23.0	53.7	43.9
Freight and passenger vessels.....	5,312,501	5,934,629	-10.5	100.0	100.0
Freight.....	3,459,646	4,038,002	-14.3	65.1	68.0
Passengers.....	1,643,781	1,766,581	-7.0	31.0	29.8
All other sources.....	209,074	130,046	60.8	3.9	2.2
Towing vessels and unrigged craft.....	9,948,718	9,342,145	6.5	100.0	100.0
Freight.....	2,211,800	3,412,867	-35.2	22.2	36.5
Passengers.....	129,404	15,780	720.1	1.3	0.2
All other sources.....	7,607,514	5,913,498	28.6	76.5	63.3
Ferryboats.....	1,060,470	1,553,121	-31.7	100.0	100.0
Passengers.....	631,113	498,747	26.5	59.5	32.1
All other sources.....	429,357	1,054,374	-59.3	40.5	67.9
All other craft, including yachts.....	1,118,057	512,143	118.3	100.0	100.0
Passengers.....	405	135	200.0	(²)	(²)
All other sources.....	1,117,652	512,008	118.3	100.0	99.9

¹ A minus sign (-) denotes decrease. ² Less than one-tenth of 1 per cent.

The income of towing vessels and their tows exceeded the income of all other vessels in both years, constituting 57 per cent of the total income in 1916 and 53.9 per cent in 1906. The income for towboats reported separately is included under "all other sources" and also the income for towing in cases where the operators owned both unrigged craft and towing vessels and reported separately the income from freight vessels and reported separately the income from freight and that from towing service.

The income of ferryboats reported as from "all other sources" includes ferrying of teams, loaded vehicles, live stock, etc.

DIAGRAM 6.—GROSS INCOME OF ALL VESSELS AND CRAFT, BY SOURCE OF INCOME AND BY OCCUPATION: 1916 AND 1906.



FREIGHT.

The freight handled by all water craft, in round numbers, was 40,169,000 net tons in 1916, as compared with 31,627,000 tons in 1906 and 29,401,000 tons in 1889,

the increase for the period 1906-1916 being 27 per cent, and for the period 1889-1906, 7.6 per cent.

Table 16 gives the statistics of freight and lighterage by class and river system for 1916, 1906, and 1889 with amount and per cent of increase.

TABLE 16.—FREIGHT SHIPMENTS AND LIGHTERAGE, BY CLASS AND RIVER SYSTEM, WITH AMOUNT AND PER CENT OF INCREASE: 1916, 1906, AND 1889.

CLASS AND RIVER SYSTEM.	FREIGHT AND LIGHTERAGE (TONS OF 2,000 POUNDS).			INCREASE. ¹			
				Amount.		Per cent.	
	1916	1906	1889	1906-1916	1889-1906	1906-1916	1889-1906
Aggregate.....	40,169,427	31,626,981	29,401,409	8,542,446	2,225,572	27.0	7.6
Freight.....	27,962,583	26,436,690	28,289,503	1,525,893	-1,852,813	5.8	-6.5
Steam ²	7,992,998	6,787,994	10,345,504	1,205,004	-3,557,510	17.8	-34.4
Unrigged.....	19,969,585	19,648,696	17,943,999	320,889	1,704,697	1.6	9.5
Lighterage or harbor work.....	12,206,844	5,190,291	1,111,906	7,016,553	4,078,385	135.2	366.8
Ohio system.....	22,953,076	17,868,729	16,041,866	5,084,347	1,826,863	28.5	11.4
Freight.....	15,572,149	15,514,582	15,796,968	57,567	-282,386	0.4	-1.8
Steam ²	1,883,776	1,278,305	3,806,665	604,471	-2,527,860	47.2	-66.4
Unrigged.....	13,688,373	14,235,277	11,990,303	-546,904	2,244,974	-3.8	18.7
Lighterage or harbor work.....	7,380,927	2,354,147	244,898	5,026,780	2,109,249	213.5	861.3
Upper Mississippi system.....	2,412,478	2,240,191	6,958,340	172,287	-4,718,149	7.7	-67.8
Freight.....	754,451	1,758,101	6,260,448	-1,003,650	-4,502,347	-57.1	-71.9
Steam ²	137,126	273,362	2,151,624	-136,236	-1,878,262	-49.8	-87.3
Unrigged.....	617,325	1,484,739	4,108,824	-867,414	-2,624,085	-58.4	-63.9
Lighterage or harbor work.....	1,658,927	482,090	697,892	1,175,837	-215,802	243.9	-30.9
Lower Mississippi system.....	14,803,873	11,518,061	6,401,203	3,285,812	5,116,858	28.5	79.9
Freight.....	11,635,983	9,164,007	6,232,087	2,471,976	2,931,920	27.0	47.0
Steam ²	5,972,096	5,235,327	4,387,215	736,769	848,112	14.1	19.3
Unrigged.....	5,663,887	3,928,680	1,844,872	1,735,207	2,083,808	44.2	113.0
Lighterage or harbor work.....	3,167,890	2,354,054	169,116	813,836	2,184,938	34.6	1,292.0

¹ A minus sign (—) denotes decrease.

² Includes 12,332,713 tons of freight transferred by railway car ferries.

³ Includes 6,905,597 tons of freight transferred by railway car ferries.

⁴ Includes craft propelled by machinery.

In 1916 freight constituted 69.6 per cent of the aggregate tonnage handled and lighterage or harbor work 30.4 per cent, the corresponding proportions in 1906 being 83.6 per cent and 16.4 per cent, and in 1889, 96.2 per cent and 3.8 per cent, respectively. Of the freight handled, 28.6 per cent was reported for steam vessels in 1916, 25.7 per cent in 1906, and 36.6 per cent in 1889, the balance being towed on barges, flats, or scows. Nearly three-fifths of the freight had its origin on the Ohio River system, 55.7 per cent in 1916, 58.7 per cent in 1906, and 55.8 per cent in 1889; and 41.6 per cent originated on the Lower Mississippi River system in 1916, 34.7 per cent in 1906, and 22 per cent in 1889. The Upper Mississippi River system contributed but 2.7 per cent of the freight in 1916, 6.7 per cent in 1906, and 22.1 per cent in 1889.

The freight handled includes car freight transferred in cars between railway points. This amounted to 12,332,713 tons in 1916 and to 6,905,597 tons in 1906.

Ferry freight in wagons and live stock ferried on the hoof are not included, as such returns were not, as a rule, obtainable.

Table 17 shows the freight transported in 1916, 1906, and 1889 by commodities, the figures being arranged according to quantity in 1916, and also shows the tonnage increase or decrease for the intervening periods.

TABLE 17.—FREIGHT, BY COMMODITIES, WITH AMOUNT OF INCREASE: 1916, 1906, AND 1889.

COMMODITY.	FREIGHT (TONS OF 2,000 POUNDS).			AMOUNT OF INCREASE. ¹	
	1916	1906	1889	1906-1916	1889-1906
Total.....	27,962,583	26,436,690	28,289,503	1,525,893	-1,852,813
Coal.....	13,916,013	11,033,011	8,527,428	2,883,002	2,505,583
Stone, sand, etc.....	1,710,857	4,004,259	321,054	-2,293,402	3,683,205
Lumber.....	744,873	514,950	9,200,191	229,923	-8,685,241
Grain.....	617,946	390,721	1,712,498	227,225	-1,331,777
Iron ore.....	470,409	171,779	574,790	298,630	-405,011
Pig iron and steel rails.....	255,615	55,346	7,775	200,269	47,571
Petroleum and other oils.....	245,930	365,479	3,534	-119,549	361,945
Cotton.....	180,563	149,975	895,742	33,589	-748,767
Cement, brick, and lime.....	175,724	95,443	2,193	80,281	13,955
Fruits and vegetables.....	119,297	55,703	41,748	63,594	-8,092
Flour.....	99,513	81,900	89,992	17,613	-8,092
Tobacco.....	75,393	114,000	27,707	-38,607	86,293
Canned goods.....	72,820	63,697	.....	9,123	63,697
Phosphate and fertilizer.....	68,458	44,413	.....	24,045	44,413
Naval stores.....	18,515	770	.....	17,745	770
Ice.....	14,302	17,229	91,010	-2,927	-73,781
Miscellaneous merchandise.....	9,176,355	9,291,015	6,793,841	-114,660	2,497,174

¹ A minus sign (—) denotes decrease.

² Includes 12,332,713 tons of railway car freight, of which 7,350,196 tons is included under miscellaneous merchandise.

³ Includes 6,905,597 tons of railway car freight, all included under miscellaneous merchandise; not included in freight in 1906 report.

⁴ Lumber and forest products.

⁵ Iron, pig and bloom.

⁶ Mill products.

The commodities separately reported are those specially provided for on the schedule used in the canvass, and they cover 67.2 per cent of all freight in 1916, 64.9 per cent in 1906, and 76 per cent in 1889. Mis-

cellaneous merchandise includes considerable freight that could not be segregated by commodities, and undoubtedly includes some of the specified articles. In some cases no record was kept of the kind of freight handled. In 1916 coal constituted 49.8 per cent of the total freight; stone, sand, etc., chiefly sand, 6.1 per cent; lumber on an estimated tonnage basis, 2.7 per cent; grain, 2.2 per cent; and iron ore, 1.7 per

cent. No other commodity, for which figures are available, amounted to 1 per cent.

Table 18 gives freight shipments and receipts by river systems and rivers for 1916 and 1906. The figures for systems and rivers are arranged in order of shipment tonnage in 1916 and each river is credited with the freight shipped from or received at ports or landings on the river or its tributaries.

TABLE 18.—FREIGHT SHIPMENTS AND RECEIPTS, BY RIVER SYSTEMS AND RIVERS, WITH PER CENT OF INCREASE: 1916 AND 1906.

RIVER SYSTEM AND RIVER.	FREIGHT (TONS OF 2,000 POUNDS).				PER CENT OF INCREASE, 1906-1916. ¹	
	Shipments.		Receipts.		Shipments.	Receipts.
	1916	1906	1916	1906		
Total.....	27,962,583	19,531,093	27,962,583	19,531,093	(¹)	(¹)
Ohio system.....	15,572,149	15,226,805	15,127,059	14,036,946	(¹)	(¹)
Monongahela.....	8,886,753	8,925,923	925,620	545,716	-0.4	69.6
Ohio.....	4,398,043	3,142,097	13,371,023	12,296,037	(¹)	(¹)
Kanawha.....	1,232,966	975,031	91,801	63,832	26.5	43.8
Tennessee, French Broad, and Hiwassee.....	619,414	678,501	466,407	472,759	(¹)	(¹)
Cumberland.....	130,010	348,697	109,068	178,951	-48.4	-39.1
Green and Barren.....	154,102	305,144	49,982	80,902	-49.5	-38.2
Little Kanawha.....	34,925	11,239	35,160	6,953	210.7	405.7
Kentucky.....	32,360	26,775	54,358	23,525	20.9	131.1
Wabash.....	15,320	42,427	6,027	30,537	-63.9	-80.3
Muskingum.....	12,865	13,826	12,865	11,073	-7.0	16.2
All other ²	5,391	757,145	4,748	7326,661		
Lower Mississippi system.....	11,635,983	2,546,187	12,090,381	3,740,646	(¹)	(¹)
Lower Mississippi.....	11,197,872	2,168,581	11,653,613	3,487,137	(¹)	(¹)
Yazoo and Sunflower.....	181,355	108,357	186,285	62,325	67.4	198.9
White.....	89,692	43,933	88,621	25,433	104.1	248.4
Ouachita and Black of Louisiana.....	42,659	25,136	42,659	18,998	69.7	124.5
Black of Arkansas.....	28,767	20,059	24,218	20,049	43.4	20.8
Arkansas.....	26,751	24,994	27,361	35,871	7.0	-23.7
All other ³	68,897	155,127	67,624	90,835		
Upper Mississippi system.....	754,451	1,758,101	745,143	1,753,501	-57.1	-57.5
Upper Mississippi.....	427,811	595,885	423,594	597,025	-28.2	-29.0
Missouri, Osage and Gasconade.....	200,729	1,046,020	207,287	1,050,504	-80.8	-80.3
Illinois.....	125,852	107,826	114,232	105,002	18.9	8.8
All other ⁴	59	10,370	30	970		

¹ A minus sign (-) denotes decrease.

² Includes 12,332,713 tons of freight transferred by railway car ferries.

³ Does not include 6,905,597 tons of freight in cars (of which 3,135,237 tons was reported and 3,770,340 tons estimated) treated as freight in 1916.

⁴ Not comparable.

⁵ Includes in 1916, Allegheny and Big Sandy; 1906, Allegheny and Salt of Kentucky.

⁶ Includes 754,793 tons of sand and gravel dredged in Allegheny River.

⁷ Includes 321,198 tons of sand and gravel, delivered at Allegheny River ports.

⁸ Includes in 1916, Atchafalaya, Hatchie, L'Angeuille, Lafourche, Red, St. Francis, Tensas, and Macon Bayou; 1906, Atchafalaya, Black Bayou, Lafourche, Red, St. Francis, Tensas, and Macon Bayou.

⁹ Includes in 1916, Rock and St. Croix; 1906, Minnesota, St. Croix, and Salt of Iowa.

The figures for 1916 include railway car freight not included in those for 1906. This amounts to 12,332,713 tons, of which 10,336,490 tons are in the Lower Mississippi system and 1,996,223 tons in the Ohio system, the latter comprising 1,808,978 tons on the Ohio River and 187,245 tons on the Tennessee. In the case of railway car freight the traffic is confined to the respective rivers and the water routes are comparatively short, the longest being on the Tennessee River, between Guntersville and Hobbs Island, Ala.

The per cent distribution of freight shipments and receipts by river systems and rivers, excluding railway car freight, is shown in Table 19 for 1916 and 1906. These data are based upon Table 18, excluding the freight on the Ohio, Tennessee, and Lower Mississippi Rivers in 1916 transported, without breaking bulk, in railway cars on freight steamers and barges.

TABLE 19.—FREIGHT SHIPMENTS AND RECEIPTS, BY RIVER SYSTEMS AND RIVERS, PER CENT OF TOTAL: 1916 AND 1906.¹

RIVER SYSTEM AND RIVER.	PER CENT OF TOTAL.			
	Shipments.		Receipts.	
	1916	1906	1916	1906
Total.....	100.0	100.0	100.0	100.0
River system:				
Ohio.....	86.9	78.0	84.0	71.9
Lower Mississippi.....	8.3	13.0	11.2	19.1
Upper Mississippi.....	4.8	9.0	4.8	9.0
River:				
Monongahela.....	56.9	45.7	5.9	2.8
Ohio.....	16.6	16.1	74.0	63.0
Mississippi.....	8.2	14.2	11.1	20.9
Upper.....	2.7	3.1	2.7	3.1
Lower.....	5.5	11.1	8.4	17.8
Kanawha.....	7.9	5.0	0.6	0.3
Tennessee, French Broad, and Hiwassee.....	2.8	3.5	1.8	2.4
Missouri, Osage, and Gasconade.....	1.3	5.4	1.3	5.4
Yazoo and Sunflower.....	1.2	0.6	1.2	0.3
Cumberland.....	1.2	1.8	0.7	0.9
Green and Barren.....	1.0	1.6	0.3	0.4
Illinois.....	0.8	0.5	0.7	0.5
All other.....	2.1	5.6	2.4	3.1

¹ Not including railway car freight.

Table 20 presents statistics of freight shipments by commodities, according to class of vessel, steam and unriggered, for 1916 and 1906 by river systems and for 1916 by rivers.

The figures for the rivers are arranged according to the aggregate of freight shipments.

The rivers with over 500,000 tons are the Mississippi, Monongahela, Ohio, Kanawha, and Tennessee,

in the order named, the latter including its tributaries, the French Broad and the Hiwassee.

For comparative purposes lumber, ordinarily reported in terms of thousand feet, and petroleum and other oils, ordinarily reported in barrels, are given in net tons, the quantities of the former in thousand feet and of the latter in barrels, being given in the notes at the bottom of the table.

TABLE 20.—FREIGHT SHIPMENTS, BY COMMODITIES (TONS OF 2,000 POUNDS) AND CLASS OF VESSEL: RIVER SYSTEMS, 1916 AND 1906; AND RIVERS, 1916.

CLASS, RIVER SYSTEM, AND RIVER.	Total.	Coal.	Stone, sand, etc.	Lum- ber.	Grain.	Iron ore.	Pig iron and steel ralls.	Petro- leum and other oils.	Cot- ton.	Cem- ent, brick, and lime.	Fruits and vege- tables.	Flour.	To- bac- co.	Canned goods.	Phos- phate and ferti- lizer.	Naval stores.	Ice.	Miscel- laneous mer- chan- dise.
Total:																		
1916.....	27,962,583	13,916,013	1,710,857	744,873	617,946	470,409	255,615	245,930	180,563	175,724	119,297	99,513	75,393	72,820	68,458	18,515	14,302	9,176,355
1906.....	19,531,093	11,033,011	4,004,259	514,950	380,721	171,779	55,346	365,479	140,975	95,443	55,703	81,900	114,000	63,697	44,413	770	17,229	2,385,418
Steam ?—																		
1916.....	7,992,998	754,562	444,166	78,491	185,094	276	18,471	21,845	58,760	93,756	90,471	78,704	74,717	61,305	47,961	502	11,299	5,972,708
1906.....	2,355,386	50,361	59,343	110,097	235,550	402	47,092	20,939	140,022	43,185	50,627	80,426	113,937	62,949	41,433	770	16,592	1,275,661
Unriggered—																		
1916.....	19,969,585	13,161,451	1,266,691	666,382	432,942	470,133	237,144	224,085	121,893	81,968	28,826	20,809	676	11,515	20,497	18,013	3,003	3,203,647
1906.....	17,175,707	10,982,650	3,944,916	398,853	145,171	171,377	8,234	344,540	6,953	52,258	5,076	1,474	63	748	2,980	.....	637	1,109,757
RIVER SYSTEMS.																		
Ohio system:																		
1916.....	15,572,149	10,949,685	700,060	284,937	241,173	259,859	209,436	28,917	24,532	97,104	55,253	67,782	74,625	39,036	38,258	33	7,531	2,493,928
1906.....	15,226,805	10,968,307	1,969,732	279,436	230,705	171,777	54,410	18,477	40,628	70,329	39,743	55,836	112,453	46,793	36,094	105	11,387	1,120,593
Steam ?—																		
1916.....	1,883,776	6,659	2,514	53,287	123,165	4	16,642	16,726	17,914	46,283	52,032	60,606	73,965	36,762	36,614	33	6,399	1,334,171
1906.....	1,246,437	48,616	35,034	77,112	137,447	400	46,306	18,394	40,628	35,532	36,258	55,560	112,403	46,578	35,649	105	10,967	509,448
Unriggered—																		
1916.....	13,688,373	10,943,026	697,546	231,650	118,008	259,855	192,794	12,191	6,618	50,821	3,221	7,176	660	2,274	1,644	.....	1,132	1,159,757
1906.....	13,980,368	10,919,691	1,934,698	202,324	93,258	171,377	8,104	83	.....	34,797	3,485	276	50	215	445	.....	420	611,145
Upper Mississippi system:																		
1916.....	754,451	34,174	404,179	5,604	70,043	.....	50	282	.....	2,500	25,239	4,301	2	1,862	130	.....	1,268	204,817
1906.....	1,758,101	27,421	1,274,785	12,676	92,868	2	400	526	.....	15,238	11,397	5,061	318	2,763	179	58	1,792	312,617
Steam ?—																		
1916.....	137,126	3,616	1,368	2,126	20,137	.....	25	266	.....	1,756	20,766	442	2	103	130	.....	78	86,311
1906.....	273,362	1,027	23,680	5,537	47,832	2	400	431	.....	1,208	9,837	4,596	31	2,566	154	58	1,695	174,029
Unriggered—																		
1916.....	617,325	30,558	402,811	3,478	49,906	.....	25	16	.....	744	4,473	3,859	.....	1,759	.....	.....	1,190	118,506
1906.....	1,484,739	26,394	1,251,105	7,139	45,036	.....	.....	95	.....	14,030	1,560	465	8	197	25	.....	97	138,588
Lower Mississippi system:																		
1916.....	11,635,983	2,932,154	606,618	454,332	306,730	210,550	46,129	216,731	156,031	76,120	38,805	27,430	766	31,922	30,070	18,482	5,503	6,477,610
1906.....	2,546,187	37,283	759,742	222,838	57,148	.....	536	346,476	106,347	9,876	4,563	21,003	1,229	14,141	8,140	607	4,050	952,208
Steam ?—																		
1916.....	5,972,096	744,287	440,284	23,078	41,702	272	1,804	4,853	40,846	45,717	17,673	17,656	750	24,440	11,217	469	4,822	4,552,226
1906.....	835,587	718	629	33,448	50,271	.....	386	2,114	99,394	6,445	4,532	20,270	1,224	13,805	5,630	607	3,930	592,184
Unriggered—																		
1916.....	5,663,887	2,187,867	166,334	431,254	265,028	210,278	44,325	211,878	115,185	30,403	21,132	9,774	16	7,482	18,853	18,013	681	1,925,384
1906.....	1,710,600	36,565	759,113	189,390	6,877	.....	150	344,362	6,953	3,431	31	733	5	336	2,510	.....	120	360,024
RIVERS: 1916.																		
Mississippi.....	11,625,683	2,945,330	899,149	334,776	306,890	210,550	46,154	216,681	147,519	76,346	38,014	26,217	741	30,907	29,962	18,482	6,352	6,291,613
Upper Mississippi.....	427,811	13,177	320,176	1,951	2,183	.....	25	9	.....	465	815	134	.....	1,504	.....	.....	1,124	86,248
Steam ?.....	42,157	35	60	166	1,151	.....	.....	2	.....	16	752	.....	.....	1	.....	.....	26	39,958
Unriggered.....	385,654	13,142	320,116	1,795	1,032	.....	25	7	.....	449	63	134	.....	1,503	.....	.....	1,098	46,290
Lower Mississippi.....	11,197,872	2,932,153	578,973	332,825	304,707	210,550	46,129	216,672	147,519	75,881	37,199	26,083	741	29,403	29,962	18,482	5,228	6,205,365
Steam ?.....	5,923,483	744,287	440,272	9,491	40,921	272	1,804	4,819	39,283	45,624	16,069	16,761	739	23,232	11,192	469	4,628	4,523,620
Unriggered.....	5,274,389	2,187,866	138,701	323,334	263,786	210,278	44,325	211,853	108,236	30,257	21,130	9,322	2	6,171	18,770	18,013	600	1,681,745
Monongahela—																		
Unriggered.....	8,886,753	8,713,227	1,300	116	58	.....	130,959	.....	.....	265	.....	222	.....	.....	.....	.....	.....	40,606
Ohio.....	4,398,043	1,038,739	667,376	57,853	131,258	174,355	58,266	23,426	370	69,500	40,388	32,985	38,652	28,583	16,252	33	4,660	2,015,347
Steam ?.....	1,487,140	2,232	925	19,958	53,879	.....	16,533	13,221	370	21,855	37,923	28,828	38,174	26,309	15,695	33	3,538	1,207,667
Unriggered.....	2,910,903	1,036,507	666,451	37,895	77,379	174,355	41,733	10,205	.....	47,645	2,465	4,157	478	2,274	557	.....	1,122	807,680
Kanawha.....	1,232,966	1,164,475	765	846	7,162	500	75	2,791	.....	12,359	5,063	9,875	5,071	2,958	1,560	.....	1,200	18,266
Steam ?.....	65,473	.....	15	746	7,162	.....	25	2,791	.....	12,359	5,063	9,875	5,071	2,958	1,560	.....	1,200	16,648
Unriggered.....	1,167,493	1,164,475	750	100	.....	500	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,618
Tennessee, French Broad and Hiwassee.....	619,414	17,118	3,598	170,555	45,645	85,004	20,136	2,223	24,162	11,378	6,806	13,652	558	4,662	13,830	.....	116	199,971
Steam ?.....	162,089	583	919	13,816	30,703	4	84	365	17,544	8,467	6,407	10,673	531	4,662	12,743	.....	116	48,472
Unriggered.....	457,325	16,535	2,679	156,739	8,942	85,000	20,052	1,858	6,618	2,911	399	2,979	27	.....	1,087	.....	.....	151,499
Missouri, Osage and Gasconade.....	200,729	4,457	79,253	2,858	20,398	.....	25	250	.....	935	363	4,067	2	308	30	.....	94	87,689
Steam ?.....	45,163	2,426	1,308	1,730	15,334	.....	25	241	.....	640	9	342	2	52	30	.....	2	22,022
Unriggered.....	155,566	1,031	77,945	1,128	5,064	.....	.....	9	.....	295	354	3,725	.....	256	.....	.....	92	65,667
Yazoo and Sunflower.....	181,385	.....	25	48,793	867	.....	.....	14	6,310	186	.....	560	24	2,105	57	.....	85	122,359
Steam ?.....	6,344	.....	12	202	281	.....	.....	7	810	78	.....	320	11	878	25	.....	34	3,686
Unriggered.....	175,041	.....	13	48,591	586	.....	.....	7	5,500	108	.....	240	13	1,227	32	.....	51	118,673

¹ Includes 12,332,713 tons of railway freight transferred in cars.

² Thousand feet, 544,203.

³ Barrels, 1,553,878.

⁴ Does not include 6,905,597 tons of freight in railway cars; treated as freight in 1916.

⁵ Thousand feet, 225,545.

⁶ Barrels, 2,256,230.

⁷ Includes craft propelled by machinery.

TABLE 20.—FREIGHT SHIPMENTS, BY COMMODITIES (TONS OF 2,000 POUNDS) AND CLASS OF VESSEL: RIVER SYSTEM, 1916 AND 1906; AND RIVERS, 1916—Continued.

CLASS, RIVER SYSTEM, AND RIVER.	Total.	Coal.	Stone, sand, etc.	Lum- ber.	Grain.	Iron ore.	Pig iron and steel rails.	Petro- leum and other oils.	Cot- ton.	Cem- ent, brick, and lime.	Fruits and vege- tables.	Flour.	To- bac- co.	Canned goods.	Phos- phate and fertil- izer.	Naval stores.	Ice.	Miscel- laneous mer- chan- dise.
RIVERS: 1916—contd.																		
Cumberland.....	180,010	1,674		43,730	21,714			153		1,289	242	1,175	18,849	33	4,186		10	86,955
Steam ¹	99,493	1,564		17,493	21,264			153		1,289	242	1,175	18,849	33	4,186		10	33,235
Unrigged.....	80,517	110		26,237	450													53,720
Green and Barren.....	154,102	11,476	18,441	9,699	16,433			31		95	75	659	100	20	430		334	96,339
Steam ¹	8,268	15	655	714	76			31		95	75	659		20	430		334	5,164
Unrigged.....	145,834	11,461	17,786	8,955	16,357								100					91,175
Illinois.....	125,852	16,540	4,750	795	47,462			23		1,100	24,061	100		50	100		50	30,821
Steam ¹	49,747	155		240	3,652			23		1,100	20,005	100		50	100		50	24,272
Unrigged.....	76,105	16,385	4,750	555	43,810						4,056							6,549
White.....	89,652		8,850	14,715	756			42	1,582	33	1	598		205			140	62,730
Steam ¹	9,699			852	509			27	270	15		500		150			120	7,265
Unrigged.....	79,953		8,850	13,863	256			15	1,312	18	1	98		55			20	55,465
Ouachita and Black of Louisiana.....	42,659			36,252											51			6,356
Steam ¹	1,525																	1,525
Unrigged.....	41,134			36,252											51			4,831
Little Kanawha.....	34,925	262		1,350	30			218		1,500	1,000	7,630	8,500	2,520			1,210	10,705
Steam ¹	27,620				30			90		1,500	1,000	7,590	8,500	2,520			1,200	5,190
Unrigged.....	7,305	262		1,350				128				40					10	5,515
Kentucky.....	32,360	514	6,000	698	673					78	844	6	2,735				1	20,811
Steam ¹	20,585	65		440	651					78	709	6	2,68				1	15,955
Unrigged.....	11,775	449	6,000	258	22						135		53					4,856
Black of Arkansas.....	28,767		300	2,745	25				30			75					40	25,552
Steam ¹	4,527			1,170					30			75					40	3,212
Unrigged.....	24,240		300	1,575	25													22,340
Arkansas.....	26,751	1	18,200	14	63			2	77	7		9	1	5				8,372
Steam ¹	2,400																	2,400
Unrigged.....	24,351	1	18,200	14	63			2	77	7		9	1	5				5,972
Wabash—Unrigged.....	15,320		80		14,800													440
Muskingum—Steam ¹	12,865	2,200		120	3,400			45		640	400	1,800	160	260	2,000			1,840
Red of Arkansas— Unrigged.....	6,560			6,560														
St. Francis.....	6,110			1,060	262				30	5		100		20				4,633
Steam ¹	1,275																	1,275
Unrigged.....	4,835			1,060	262				30	5		100		20				3,358
Bayou Lafourche— Unrigged.....	5,200																	5,200
Allotherivers.....	56,477		2,770	11,368	50			31	483	8	1,818	5		184			10	39,750
Ohio system ²	5,391		2,500					30			213							2,648
Upper Missis- sippi system ³	59																	59
Lower Missis- sippi system ⁴	51,027		270	11,368	50			1	483	8	1,605	5		184			10	37,043
Steam ¹	23,145			11,363				30	453		1,817			180				9,302
Unrigged.....	33,332		2,770	5	50			1	30	8	1	5		4			10	30,448

¹ Includes craft propelled by machinery.² Includes Allegheny, Big Sandy, and Middle Island Creek.³ Includes Rock and St. Croix.⁴ Includes Atchafalaya, Hatchie, L'Anguille, Macon Bayou, and Tensas.

Coal constituted 49.8 per cent of all freight in 1916 and 56.5 in 1906, and on the Ohio system it formed 70.3 per cent in 1916 and 72 per cent in 1906. On the Upper Mississippi system, stone, sand, etc., led in tonnage, with 53.6 per cent in 1916 and 72.5 per cent in 1906, and on the Lower Mississippi system miscellaneous or unclassified merchandise led, with 55.7 per cent of the total freight in 1916 and 37.4 per cent in 1906.

As a rule towed freight exceeds that carried on steamers, and the following table shows for 1916 and 1906 the percentage distribution as between freight carried on steam vessels and that towed on unrigged vessels for the river systems and the leading rivers.

Steamer freight exceeded towed freight in 1916 only on the Cumberland, Little Kanawha, and Muskingum of the listed rivers, and in 1906 on the Little Kanawha, Muskingum, White, Ouachita and Black of Louisiana, and Arkansas.

TABLE 21.—FREIGHT SHIPMENTS, PER CENT DISTRIBUTION, BY CLASS OF VESSELS: 1916 AND 1906.

RIVER SYSTEM AND RIVER.	STEAM. ¹		UNRIGGED.	
	1916	1906	1916	1906
Total.....	10.3	12.1	89.7	87.9
Ohio system.....	7.5	8.2	92.5	91.8
Ohio.....	24.3	28.3	75.7	71.7
Monongahela.....		0.1	100.0	99.9
Kanawha.....	5.3	3.8	94.7	96.2
Tennessee, French Broad, and Hiwassee.....	35.5	24.7	62.5	75.3
Cumberland.....	53.3	20.2	44.7	79.8
Green and Barren.....	5.4	6.3	94.6	93.7
Little Kanawha.....	79.1	84.5	20.9	15.5
Wabash.....		3.0	100.0	97.0
Muskingum.....	100.0	100.0		
Upper Mississippi system.....	18.2	15.5	81.8	84.5
Upper Mississippi.....	9.9	25.8	90.1	74.2
Missouri, Gaseonade, and Osage.....	22.5	11.3	77.5	88.7
Illinois.....	39.5	31.0	60.5	69.0
Lower Mississippi system.....	35.0	32.8	65.0	67.2
Lower Mississippi.....	62.9	32.0	47.1	68.0
Yazoo and Sunflower.....	3.5	48.7	96.5	51.3
White.....	10.8	57.9	89.2	42.1
Ouachita and Black of Louisiana.....	3.6	72.1	96.4	27.9
Black of Arkansas.....	15.7	0.1	84.3	99.9
Arkansas.....	9.0	92.7	91.0	7.3

¹ Includes craft propelled by machinery.

The distribution of the railway car freight by commodities and by river systems is given in Table 22, the greater portion of the same being miscellaneous merchandise.

TABLE 22.—RAILWAY CAR FREIGHT, BY COMMODITIES (TONS OF 2,000 POUNDS): 1916.

COMMODITY.	Total.	Ohio (Ohio and Tennessee Rivers).	Lower Mississippi.
Total.....	12,332,713	1,996,223	10,336,490
Coal.....	2,882,773	43,454	2,839,319
Stone, sand, etc.....	573,690	76,530	497,160
Lumber.....	276,021	7,950	268,071
Grain.....	271,901	8,709	263,192
Iron ore.....	469,739	259,354	210,385
Pig iron and steel rails.....	88,882	42,890	45,992
Petroleum and other oils.....	120,590	1,858	118,732
Cotton.....	113,871	4,770	109,101
Cement, brick, and lime.....	96,092	30,566	65,526
Fruits and vegetables.....	27,971	1,566	26,405
Flour.....	12,323	3,228	9,095
Tobacco.....	114	89	25
Canned goods.....	3,451	.....	3,451
Phosphate and fertilizer.....	28,286	100	28,186
Naval stores.....	18,413	.....	18,413
Ice.....	400	.....	400
Miscellaneous merchandise.....	7,350,196	1,515,159	5,835,037

Table 23 shows the per cent distribution for 1916 and 1906 of freight tonnage by commodities for the

river systems, excluding railway car freight to make the figures comparable.

TABLE 23.—PER CENT DISTRIBUTION OF FREIGHT SHIPMENTS, BY COMMODITIES: ¹ 1916 AND 1906.

COMMODITY.	TOTAL.		OHIO SYSTEM.		UPPER MISSISSIPPI SYSTEM.		LOWER MISSISSIPPI SYSTEM.	
	1916	1906	1916	1906	1916	1906	1916	1906
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Coal.....	70.6	56.5	80.3	72.0	4.5	1.6	7.1	1.5
Stone, sand, etc.....	7.3	20.5	4.6	12.9	53.6	72.5	8.4	29.8
Lumber.....	3.0	2.6	2.0	1.8	0.7	0.7	14.3	8.8
Grain.....	2.2	1.9	1.7	1.5	9.3	5.3	3.4	2.2
Pig iron and steel rails.....	1.1	0.3	1.2	0.4	(²)	(²)	(²)	(²)
Petroleum and other oils.....	0.8	1.9	0.2	0.1	(²)	(²)	7.5	13.6
Cotton.....	0.4	0.8	0.1	0.3	.....	.....	3.6	4.2
Cement, brick, and lime.....	0.5	0.5	0.5	0.5	0.3	0.9	0.8	0.4
Fruits and vegetables.....	0.6	0.3	0.4	0.3	3.3	0.6	1.0	0.2
Flour.....	0.6	0.4	0.5	0.4	0.6	0.3	1.4	0.8
Tobacco.....	0.5	0.6	0.5	0.7	(²)	(²)	0.1	(²)
Canned goods.....	0.4	0.3	0.3	0.2	0.2	0.2	2.2	0.6
Miscellaneous merchandise.....	12.0	13.4	7.7	8.8	27.5	17.9	50.2	37.9

¹ Not including railway car freight.

² Less than one-tenth of 1 per cent.

The comparative statistics for freight receipts by commodities for 1916 and 1906 for the river systems and the statistics for commodity receipts by rivers for 1916 only are given in Table 24.

TABLE 24.—FREIGHT RECEIPTS, BY COMMODITIES (TONS OF 2,000 POUNDS): RIVER SYSTEMS, 1916 AND 1906; AND RIVERS, 1916.

RIVER SYSTEM AND RIVER.	Total.	Coal.	Stone, sand, etc.	Lumber.	Grain.	Iron ore.	Pig iron and steel rails.	Petroleum and other oils.	Cotton.	Cement, brick, and lime.	Fruits and vegetables.	Flour.	Tobacco.	Canned goods.	Phosphate and fertilizer.	Naval stores.	Ice.	Miscellaneous merchandise.
Total:																		
1916.....	27,962,583	13,916,013	1,710,857	744,873	617,946	470,409	255,615	245,930	180,563	175,724	119,297	99,513	75,393	72,820	68,458	18,515	14,302	9,176,355
1906.....	19,531,093	11,033,011	4,004,259	514,950	380,721	171,779	55,346	365,479	146,975	95,443	55,703	81,900	114,000	63,097	44,413	770	17,229	2,385,418
RIVER SYSTEMS.																		
Ohio:																		
1916.....	15,127,059	10,472,766	709,060	308,633	240,078	259,859	209,436	20,817	24,060	97,393	55,253	68,617	74,589	39,075	38,374	33	7,531	2,492,485
1906.....	14,036,946	9,798,750	1,925,442	320,458	229,212	171,777	54,410	8,522	40,218	65,970	39,748	57,617	112,480	46,793	36,094	105	11,687	1,107,663
Upper Mississippi:																		
1916.....	745,143	34,174	395,179	5,604	70,043	.....	50	282	.....	2,500	25,239	4,301	.....	1,795	130	.....	1,268	204,576
1906.....	1,753,501	27,492	1,274,654	13,929	68,750	2	400	674	50	15,803	5,674	5,726	.....	6,258	264	108	2,297	330,872
Lower Mississippi:																		
1916.....	12,090,381	3,409,073	606,618	430,636	307,825	210,550	46,129	215,831	156,503	75,831	38,805	26,595	802	31,950	29,954	18,482	5,503	6,479,294
1906.....	3,740,646	1,206,769	804,163	180,663	82,759	.....	536	346,283	106,707	13,670	10,281	18,557	972	10,646	8,055	3,245	3,455	946,883
RIVERS: 1916.																		
Ohio.....	13,371,023	9,656,670	667,376	228,949	153,215	174,355	73,285	23,408	370	65,458	40,981	28,740	49,341	27,304	15,352	.....	4,510	2,161,676
Mississippi.....	12,077,207	3,421,649	855,309	322,535	305,634	210,550	46,154	215,001	149,148	72,641	39,283	25,157	777	18,929	28,136	18,482	6,152	6,311,670
Upper.....	423,594	13,177	311,336	1,951	2,782	.....	25	165	.....	3,615	3,539	.....	.....	22	.....	.....	1,124	85,849
Lower.....	11,653,613	3,408,472	573,973	320,584	302,852	210,550	46,129	214,992	149,148	72,476	35,698	21,618	777	18,907	28,136	18,482	5,028	6,225,821
Monongahela.....	925,620	756,650	1,300	116	58	.....	132,100	.....	.....	265	222	100	.....	50	.....	.....	.....	34,759
Tennessee, French Broad, and Hiwassee.....	466,407	17,118	3,598	50,234	44,326	85,004	2,801	2,287	23,690	11,667	6,806	14,487	522	4,662	13,946	.....	116	185,143
Missouri, Osage, and Gasconade.....	207,287	4,457	79,253	2,858	19,799	.....	25	250	.....	935	363	662	2	1,723	30	.....	94	96,836
Yazoo and Sunflower.....	186,235	.....	25	49,193	667	.....	.....	14	5,610	.....	.....	560	24	2,105	57	.....	285	127,359
Illinois.....	114,232	16,540	4,590	795	47,462	.....	.....	23	.....	1,400	21,261	100	.....	50	100	.....	50	21,861
Cumberland.....	109,068	266	.....	21,121	21,714	.....	.....	312	.....	1,389	274	1,450	10,124	83	4,186	.....	10	48,139
Kanawha.....	91,801	10,560	10,175	860	7,235	500	120	2,829	.....	12,364	5,054	9,645	5,471	2,971	1,760	.....	1,210	21,047
White.....	88,621	.....	9,150	14,908	781	.....	.....	42	1,590	.....	83	593	.....	205	.....	.....	140	61,168
Kentucky.....	54,358	17,564	6,000	4,642	4,453	.....	.....	405	.....	3,778	449	3,006	469	850	1,030	.....	301	11,611
Green and Barren.....	49,982	11,476	18,031	1,201	397	.....	.....	471	.....	310	66	1,704	.....	345	100	.....	174	15,707
Ouachita and Black of Louisiana.....	42,659	.....	.....	36,252	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51	.....	.....	6,356
Little Kanawha.....	35,160	282	.....	1,350	30	.....	.....	218	.....	1,500	1,000	7,665	8,500	2,520	.....	1,210	.....	10,905
Arkansas.....	27,361	601	18,200	14	63	.....	.....	2	77	.....	7	9	1	5	.....	.....	.....	8,382
Black of Arkansas.....	24,218	.....	.....	2,000	.....	.....	.....	.....	13	.....	.....	75	.....	.....	.....	40	.....	22,090
Muskingum.....	12,865	2,200	.....	120	3,400	.....	.....	45	.....	640	400	1,800	160	260	2,000	.....	.....	1,840
Red.....	6,560	.....	.....	6,560	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Francis.....	6,110	.....	.....	1,060	262	.....	.....	.....	30	5	.....	100	.....	20	.....	.....	.....	4,633
Webash.....	6,027	80	.....	40	5,250	.....	.....	12	.....	22	.....	1	20	2	30	.....	.....	570
Bayou Lafourche.....	5,200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,200
All other.....	54,532	7,770	.....	65	3,200	.....	1,130	811	35	2,924	3,131	3,635	.....	10,708	1,710	.....	10	19,403
Ohio system.....	4,748	2,500	.....	.....	.....	.....	1,130	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,088
Upper Mississippi system.....	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30
Lower Mississippi system.....	49,754	5,270	65	3,200	.....	.....	.....	781	35	2,924	3,131	3,635	.....	10,708	1,710	.....	10	18,285

¹ Includes 12,332,713 tons of railway freight transferred in cars.

² Thousand feet, 344,203.

³ Barrels, 1,553,378.

⁴ Does not include 6,905,597 tons of railway freight transferred in cars; treated as freight in 1916.

⁵ Thousand feet, 225,545.

⁶ Barrels, 2,256,230.

The figures for the rivers are arranged according to the aggregate freight receipts, and the order differs somewhat from that based upon shipments as given in Table 20.

COMMERCE OF THE RIVERS.

The commerce of the Mississippi River and its tributaries is here considered, beginning with the Ohio and its affluents in the order of their occurrence from source to mouth and following with the Mississippi and its affluents other than the Ohio.

Ohio and its tributaries.—The Ohio is navigable from Cairo to Pittsburgh, a distance of 967.5 miles, and is the most important commercial river in the United States. The river, aside from the traffic of its many ports, is a highway for through traffic from its tributaries, the Monongahela, Kanawha, Tennessee, etc., to the ports of the Mississippi.

Freight.—The freight handled is considerably diversified, the chief commodities separately reported being, as to shipments, coal, sand and gravel, iron, and grain, and as to deliveries the same, with the addition of lumber. The receipts exceeded the shipments by nearly 9,000,000 tons, chiefly coal from the Monongahela and the Kanawha.

The 4,398,043 tons of freight shipments in 1916 is an increase of 1,255,946 tons, or 40 per cent, over the total as reported in 1906, but a decrease of 3,127,624 tons, or 41.6 per cent, from the shipment tonnage credited to the river in 1889.

The 13,371,023 tons of freight receipts in 1916 is an increase of 1,074,986 tons, or 8.7 per cent, over that of 1906.

There are four railway car transfer points on the Ohio, two between Ashland, Ky., and Coal Grove and Ironton, Ohio, respectively, credited with 945,565 tons of car freight; one between Paducah, Ky., and Brookport, Ill., with 4,165 tons; and one between Sleeth, Ky., and Metropolis, Ill., with 859,248 tons; making a total for the river of 1,808,978 tons. In 1906 car freight was reported only for the Paducah-Brookport route, 32,868 tons.

Pittsburgh, at the head of the Ohio and at the confluence of the Monongahela and Allegheny Rivers, has the largest river commerce of any inland city of the country. The freight movement of the port in 1916 aggregated 6,727,289 tons, this being the sum of shipments and receipts, and in 1906 it aggregated 6,854,575 tons.

Following the course of the Ohio the freight movements of the ports for which data are available are given in the following tabular statement, which presents the figures for the years 1916 and 1906.

The lighterage or harbor work on the Ohio, not included in the foregoing as freight, aggregated 5,684,773 tons in 1916 and 2,249,122 tons in 1906. That assignable to the leading ports in 1916 was: Pittsburgh,

2,480,700 tons; Cincinnati, 326,800 tons; Evansville, 232,500 tons; Wheeling, 210,000 tons; Marietta, 185,700 tons; Parkersburg, 76,000 tons; and Paducah, 57,600 tons.

PORT.	TOTAL FREIGHT MOVEMENT—NET TONS.	
	1916	1906
Pittsburgh, Pa.	6,727,289	6,854,575
Wheeling, W. Va.	28,296	161,559
Marietta, Ohio.	29,491	33,480
Parkersburg, W. Va.	60,843	56,547
Catlettsburg, Ky.	2,298	9,694
Cincinnati, Ohio.	1,411,149	2,363,215
Madison, Ind.	135,382	107,053
Louisville, Ky.	369,614	1,203,727
Evansville, Ind.	251,549	416,133
Paducah, Ky.	754,552	239,808

Passengers.—The passenger traffic on the Ohio River in 1916 was exceeded only by that on the lower Mississippi. During 1916 there were 5,731,660 passengers carried, as against 4,059,617 in 1906, an increase of 1,672,043, or 41.2 per cent. Vessels propelled by steam carried 4,918,983 passengers; motor vessels, 760,818; and unrigged craft, 51,859. Each class of vessels, except freight and passenger, carried more passengers in 1916 than in 1906. The number of passengers carried on ferryboats increased 46.3 per cent; on tugs and other towing vessels, 89.6 per cent; while unrigged craft moved over 50 times as many passengers in 1916 as in 1906. The number of passengers carried on the regular freight and passenger vessels decreased 24.7 per cent. In 1916 only one freight and passenger boat ran from Pittsburgh to New Orleans, and while it carried 82,500 passengers, the traffic was limited, in the main, to local movements. The great bulk of the regular passenger traffic was done by ferryboats, which carried 71 per cent of the total in 1916, as compared with 68.5 per cent in 1906. Some of these ferryboats handle ferry business under contract with railroad companies.

Of the 1,555,724 passengers carried on freight and passenger vessels, 588,023, or 37.8 per cent, were excursion, and over 70 per cent of this number were carried by the boats of an amusement company located at Cincinnati, which carried excursionists from Cincinnati, Louisville, and other points on the Ohio to and from Coney Island, where the company maintains an amusement park. One of the boats belonging to this company is of 1,446 gross tonnage, and is the largest in operation on the river. Many small motor boats are operated up and down stream on sections of the river not paralleled by railroads. Some of this class of boats carried as many as 36,000 passengers in 1916, and often they are used for towing as well as ferrying.

One thousand regular passengers were carried across river on barges in 1906, and 47,259 in 1916. These barges are towed by small steam or gasoline motor boats, and are generally used in locations where no other means of transportation exist.

Monongahela.—The Monongahela has been improved by locks and dams from Pittsburgh to Fairmont, W. Va., a distance of 131 miles; many of the large steel mills are located on its banks, and coal, iron and steel products, and sand and gravel are the chief freight commodities. The freight is all towed. The shipments aggregated 8,886,753 tons in 1916, as compared with 8,925,923 tons in 1906, and the receipts 925,620 tons in 1916 and 545,716 tons in 1906. The difference between shipments and deliveries represents coal to lower river ports on the Ohio and Mississippi.

The harbor work credited to the Monongahela in 1916, not classed as freight, was 76,033 tons. The port data for Pittsburgh, at the mouth of this tributary, have been given above.

The Monongahela River, while one of the most important commercial streams in the United States, has never had much up-and-down stream passenger traffic. This river is paralleled practically for its entire length by rail lines. The report of the Chief Engineer of the United States Army for 1907 states that a total of 181,527 passengers were carried up and down stream on the river in 1902. This number had decreased to 101,457 in 1903 and increased to 116,174 in 1904. In 1905 it declined to 78,458. The report of the Census of Water Transportation for 1906 shows 246,486 passengers carried up and down stream by freight and passenger boats.

There was no up-and-down stream passenger traffic in boats of 5 tons register reported in 1916, and, while 354,586 passengers were carried, the traffic was all across stream and in small unrigged craft, the passengers being farmers and laborers from the mines and workshops in the vicinity of the ferries.

Allegheny.—This river, which with the Monongahela forms the Ohio, is represented by only 2,500 tons of freight and 854,401 tons of lighterage or harbor work in 1916, both being chiefly sand and gravel dredged along the river. Steamboats can ascend the river 200 miles or more from Pittsburgh. The port of Allegheny, a part of Pittsburgh in 1916, had a freight movement of 81,209 tons in 1906.

In former years passenger boats plied the Allegheny, but those have long since disappeared, and there are now no regular lines for passenger traffic. Only one gasoline boat, above 5 tons net register, was reported in 1916, and this boat carried only 700 excursion passengers to various points on the river. Barges towed by gasoline boats under 5 tons carried 13,519 passengers, or over 95 per cent of the total. These passengers were mainly workingmen employed in mills along the river.

Middle Island Creek.—Taking the tributaries of the Ohio in the order of their occurrence, the first for which water-borne traffic was reported is Middle Island Creek of West Virginia, with 243 tons shipped

from and 1,160 tons received at ports or landings. No freight traffic thereon was reported in 1906.

No passengers were reported for 1906, but 202 passengers were reported for this river in 1916.

Muskingum.—This river is 120 miles long, exclusive of its branches, and is navigable as far as Zanesville, Ohio, and a short distance above by slack-water improvements. The freight shipments on the Muskingum in 1916 aggregated 12,865 tons and the receipts the same, the traffic consisting of shipments between ports on the river. In 1906 the shipments were 13,826 tons and the receipts 11,073 tons. There were 12,350 tons of harbor work reported in 1916.

In 1916 only one steamboat operated on the river, carrying 9,000 regular and 6,000 excursion passengers. This boat operated principally between Zanesville and McConnelsville, Ohio. In 1906 freight and passenger vessels carried 76,480 passengers, of which 22,815 were excursion.

Little Kanawha.—The length of this river is about 150 miles. In 1916 the freight shipments on the Little Kanawha amounted to 34,925 tons, tobacco and flour being prominent commodities, and the receipts were 35,160 tons. In 1906 shipments were 11,239 tons and receipts 6,953 tons, the 1916 figures showing a substantial increase in river freight. No lighterage or harbor work was reported.

In 1906 one steamboat was in service on the Little Kanawha River, and carried 13,263 passengers. It operated with difficulty owing to repairs to the locks of the river improvements. In 1916 steam-propelled vessels carried 14,400 passengers; motor, 9,089; and unrigged craft, 39,660 passengers. Nearly all of the unrigged craft were local ferries operated by pulley and cable.

Kanawha.—The Kanawha or Great Kanawha, generally known above the confluence of the Gauley as New River, is navigable by steamboats to Kanawha Falls, a distance of 100 miles, and above via locks and dams. The length of the river as a whole is about 450 miles.

The freight is chiefly coal from the Kanawha district, with some cement, brick and lime, stone, sand, etc., and flour and grain, aside from miscellaneous merchandise.

The shipments aggregated 1,232,966 tons in 1916 and 975,031 tons in 1906, an increase for the period of 26.5 per cent, and the receipts aggregated 91,801 tons in 1916 and 63,832 tons in 1906. There were reported for 1916, 124,548 tons of lighterage or harbor work, as compared with 72,400 tons in 1906.

Charleston, W. Va., the principal port on the river, had a freight movement of 74,581 tons in 1916 and 38,650 tons in 1906.

In 1916 steam packet boats, carrying 11,867 passengers, operated between Charleston, Gallipolis, and Montgomery, stopping at intermediate points. Fer-

ries propelled by gasoline motors, at St. Albans, Sattes, Leon, Arbuckle, Point Pleasant, and Henderson, carried 51,700 passengers. Unrigged craft operated by pulley and cable handled 71,691, or 53 per cent of all passengers carried on this river during 1916. In 1906, 77,952 passengers were carried.

Big Sandy.—The Sandy or Big Sandy, sometimes called the Chatterawah, is navigable for small steamboats via its west fork for nearly 100 miles. The shipments, reported as miscellaneous freight in 1916, amounted to 2,648 tons and the receipts to 1,088 tons. The figures for shipments in 1906 were 1,776 tons and for receipts 4,887 tons.

Steam vessels reported 4,555 passengers in 1906. In 1916 all passenger traffic, which amounted to 56,000, was handled by unrigged craft operated by pulley and cable. The traffic was mostly miners, laborers, and farmers going to and from work. Nearly one-half of the passenger movement was at Georges Creek. There was no up-and-down stream passenger traffic in 1916.

Scioto.—The next affluent of the Ohio is the Scioto, which is navigable for about 130 miles from its mouth. No freight traffic was reported in 1916 or 1906, but in 1916 there were 20,000 tons classed as lighterage or harbor work, the same being sand and gravel dredged for the building trade. No passenger traffic was reported on this river in 1916 and 1906.

Kentucky.—The Kentucky is navigable by steamboats to Frankfort. The freight shipments credited to the river in 1916 aggregated 32,360 tons, chiefly general merchandise and tobacco, as compared with 26,775 tons in 1906, and the receipts were 54,358 tons in 1916 and 23,525 tons in 1906. Coal constituted a large part of the receipts in 1916.

Only 3,825 passengers were reported for the river in 1916. Four motor boats handled 2,881 passengers, and unrigged craft, 944. The motor boats had no regular routes, but went wherever business offered. There were 7,752 passengers carried on this river in 1906.

Green and Barren.—The Green River of Kentucky is navigable for 217 miles, and small steamboats can ascend the Barren, or the Big Barren, the chief affluent of the Green, to Bowling Green. The freight shipments in 1916 aggregated 154,102 tons, including as chief commodities, aside from miscellaneous merchandise, grain, sand and gravel, coal, and lumber. In 1906 the shipments amounted to 305,144 tons. The receipts at the river ports in 1916 amounted to 49,982 tons and in 1906 to 80,902 tons. Of the foregoing the Barren is credited for 1916 with 15,575 tons of shipments and 35,559 tons of receipts. The lighterage or harbor work reported for 1916 amounted to 10,500 tons.

Bowling Green, on the Big Barren, had a freight movement, shipments and receipts combined, of 39,541 tons in 1916, and Livermore, on the Green, of

3,363 tons. During 1916 the passenger traffic on these rivers aggregated 20,930, as compared with 45,326 in 1906, a decrease of 24,396, or 53.8 per cent. In the former year three packet lines, two operating freight and passenger vessels from Evansville to Spottsville and Calhoun and one operating a tug and barges from Evansville to Bowling Green and Mammoth Cave, carried both freight and passengers. This class of vessels handled 8,705 passengers. In addition several small-tonnage gasoline motor boats, engaged principally in handling United States mail, carried 12,025 passengers over regular routes. Unrigged craft carried 200 passengers.

Wabash and White.—The Wabash, about 517 miles long, is ordinarily navigable to Covington and during stages of high water to Lafayette. The White (of Indiana), a tributary of the Wabash, is navigable to Martinsville, on the West Fork. A small amount of freight (400 tons) was reported for Terre Haute, Ind., in 1916, and 5,250 tons for Grayville, Ill. The shipments from the ports and landings on the Wabash aggregated 15,320 tons in 1916, as compared with 42,427 tons in 1906; and the receipts were 6,027 tons in 1916 and 30,537 tons in 1906. No freight traffic was reported for the White. A relatively large tonnage of sand, gravel, etc., classed as lighterage or harbor work, was reported for the Wabash in 1916, chiefly at Patton and Mount Carmel, Ill., while 7,232 tons were reported for the White.

The total passenger traffic on these two rivers decreased from 78,391 in 1906 to 75,120 in 1916. No steam vessels were in operation in 1916. A few small-tonnage gasoline motor boats carried 16,700 passengers to various points on the river, including 400 excursionists on private yachts. Several motor-boat ferries took passengers from shore to shore on the Wabash River. These ferries handled 42,000 passengers in 1916. Tugs and other towing vessels and unrigged craft carried 16,420 passengers.

Cumberland.—The length of the river is estimated at 687 miles. Steamboats ascend to Nashville, 192 miles from its mouth, and a large portion of the river above Nashville is navigable during high water.

The freight shipments credited to the river aggregated 180,010 tons in 1916, as compared with 348,697 tons in 1906, a marked decrease; and the receipts amounted to 109,068 tons in 1916, as compared with 178,951 tons in 1906. Aside from miscellaneous merchandise the chief commodities were lumber, grain, and tobacco, with phosphate and fertilizer forming a considerable part of the balance of outgoing shipments. The chief ports on the river are Nashville, Tenn., with a freight movement of 56,251 tons in 1916 and 99,193 tons in 1906, and Burnside, Ky., with 25,301 tons in 1916 and 32,175 tons in 1906. In 1916 there were 178,302 tons of lighterage or harbor work, of which 142,453 tons were at Nashville. In 1906 the total reported for the river was 28,125 tons.

In 1916, 247,456 passengers were handled on the Cumberland River. Ferries carried 141,810; unrigged craft, 54,000; freight and passenger vessels, 51,106; and tugs and other towing vessels, 540. Of this number 150,825 were carried on vessels propelled by gasoline motors. Steam-propelled vessels handled 42,631, and the balance were carried on barges and other unrigged craft. The passenger traffic in 1916 was over five and one-half times greater than in 1906, when 43,865 passengers were handled.

Steamboats from Nashville ply to Paducah and to Burnside, which is practically the head of navigation. These boats carried 19,969 excursion and 15,262 regular passengers in 1916. Three small tonnage gasoline motor boats carried 8,485 passengers between Cumberland City, Clarksville, and Dover. Privately owned gasoline motor ferries carried 44,500 passengers across stream. There are also several municipal or quasi-municipal gasoline motor ferries owned and operated by Davidson, Dixon, Montgomery, and Chatham Counties. All of them are free ferries, no charge being made for carrying passengers. These municipal ferries carried 71,610 passengers across stream. Montgomery County also has at Clarksville a barge ferry operated by current, buoys being used to support the cable. This ferry handled 50,000 passengers in 1916. A ferry is also in operation at Cumberland City, towed by a gasoline launch under 5 tons net register, which carried 4,000 passengers.

Tennessee.—This river is the largest affluent of the Ohio, with a length of 652 miles. Steamboats can ascend to Florence, Ala., 270 miles from its mouth. The Muscle Shoals above Florence extend to Decatur, and above Decatur the river is navigable to Kingston, Tenn.

The river shipments aggregated 619,414 tons in 1916, including 6,479 tons for the French Broad and 2,100 tons for the Hiwassee, affluents of the Tennessee, and the receipts 466,407 tons, including 6,479 tons for the French Broad, the same as the shipments, and 1,650 tons for the Hiwassee. The excess of shipments over receipts, 153,007 tons, consisted chiefly of lumber and pig iron. In 1906 the river shipments were 678,501 tons and the receipts 472,759 tons.

Railway car freight to the amount of 187,245 tons is included in the statistics for the river, the transfer points being between the Chamberlain-Caney inclines of the Roane Iron Co., Tennessee, 10.5 miles, and between Gunters Landing and Hobbs Island, Ala., of the Nashville, Chattanooga & St. Louis Railway, approximately 20 miles.

The chief ports on the Tennessee are Knoxville, with a freight movement in 1916 of 9,280 tons and in 1906 of 77,828 tons; Chattanooga, with 51,760 tons in 1916 and 91,061 tons in 1906; Decatur, Ala., with 37,851 tons in 1916 and 81,078 in 1906; and Florence, Ala., with 4,050 tons in 1916 and 27,040 tons in 1906; the lighterage or harbor work on the river aggregated

267,038 tons in 1916, of which 135,860 tons were at Knoxville and 131,178 tons at Chattanooga. In 1906 but 4,500 tons of lighterage were reported, all at Knoxville.

The number of passengers carried on the Tennessee River and its tributaries, the French Broad and the Hiwassee, in 1916 was 277,205, as compared with 122,401 in 1906, an increase of 154,804, or 126.5 per cent. Unrigged craft handled 154,501 passengers, steam vessels 93,476, and gasoline motor vessels 29,228. Local boat lines have headquarters at the principal towns along the river. Several steam freight and passenger vessels operate between points on this and the Ohio and Mississippi Rivers. The longest boat service reported in 1916 was between Chattanooga, Tenn., and Joppa, Ill., a distance of 550 miles. Other regular service by steamboats was between Chattanooga and Decatur and Florence, Ala.; from Paducah, Ky., to Waterloo and Lambs Ferry; from Knoxville to Stewarts Landing, and from St. Louis to Shiloh Park, Tenn. There were 26,277 passengers handled on these boats. At Decatur, Ala., a steam ferry was in operation, which carried 52,729 passengers in 1916. There was also a steam ferry between Hobbs Island and Gunters Landing operated as a railroad transfer, which carried 14,470 passengers. Several small-tonnage gasoline motor vessels did passenger and ferry service between small towns and places where the large steam vessels did not stop. This class of boats carried 29,228 passengers. Over one-half of the passenger traffic on the Tennessee and all on the French Broad and Hiwassee Rivers was handled on unrigged craft, towed either by gasoline motor launches of under 5 tons or handled by chain or pulley and cable. There were also in operation across the Tennessee River in Knox County several barges and other unrigged craft owned by the county and under the jurisdiction of the county judge and operated as free ferries. These craft carried 47,500 passengers in 1916.

The Mississippi and its tributaries (other than the Ohio).—The Mississippi River is navigable for large river boats to St. Louis, a distance of 1,256 miles, and for smaller boats to St. Paul, a distance of about 2,150 miles from the mouth. Above the falls at Minneapolis there is some navigation as far as Cass Lake.

Freight.—The freight commerce of the upper Mississippi, aside from miscellaneous or package freight, consists chiefly of sand, gravel, etc., shipped and delivered within its territory, with some coal, grain, lumber, fruits and vegetables, and flour; and of the lower Mississippi, coal, to a large extent coming down from the Ohio, sand and gravel, lumber, grain, petroleum, iron ore, and cotton.

The freight statistics include railway car freight transferred across the Mississippi at nine points, viz, between New Orleans and Goulsboro and Algiers, 3,037,970 tons; Baton Rouge and Anchorage, 1,970,430 tons; Angola and Naples, 580,001 tons—all in

Louisiana; Natchez, Miss., and Vidalia, La., 57,202 tons; Vicksburg, Miss., and Delta, La., 658,296 tons; Trotters Point, Miss., and Helena, Ark., 330,957 tons; Kelloggs Landing, Ill., and Little Rock, Mo., 1,225,701 tons; and West Ivory, Mo., contiguous to St. Louis, and East Ivory, Ill., 2,475,183 tons, and within the port of St. Louis, 750 tons. This car freight aggregated 10,336,490 tons and constituted more than nine-tenths of the freight for the lower Mississippi. In 1906 the railway car freight of the lower Mississippi aggregated 6,617,820 tons.

These car-transshipment points are all below St. Louis, this section of the Mississippi being bridged at only two points, from Thebes, Ill., to Illmo, Mo., and at Memphis, Tenn.

The shipments credited to the river as a whole aggregated 11,625,683 tons in 1916, and the receipts 12,077,207 tons, or, excluding railway car freight, to 1,289,193 tons of shipments and 1,740,717 tons of receipts. These latter figures are comparable with 2,764,466 tons of shipments and 4,084,162 tons of receipts in 1906, a decrease for the period, excluding car freight, of 53.4 per cent in shipments and 57.4 per cent in receipts.

Following the course of the river the freight movements, shipments and receipts combined, of the ports for which data are available are as given in the following tabular statement, which presents the figures for 1916 and 1906:

PORT.	TOTAL FREIGHT MOVEMENT—NET TONS.	
	1916	1906
Dubuque, Iowa.....	374	10,260
Galena, Ill.....	6,249	5,439
Clinton, Iowa.....	37,127	37,503
Moline, Ill.....	58,363	56,336
Davenport, Iowa.....	99,667	95,163
Rock Island, Ill.....	1,074	84,594
Muscataine, Iowa.....	36,054	21,934
Burlington, Iowa.....	50,201	35,777
Quincy, Ill.....	10,722	39,222
Alton, Ill.....	11,267	33,604
St. Louis, Mo.....	154,813	743,981
Cairo, Ill.....	66,886	247,239
Memphis, Tenn.....	287,047	662,308
Helena, Ark.....	1,342,213	60,463
Greenville, Miss.....	61,564	39,519
Vicksburg, Miss.....	1,778,148	375,454
Natchez, Miss.....	1,77,657	56,966
Baton Rouge, La.....	1,2,086,786	15,508
New Orleans, La.....	1,3,528,239	1,036,613

¹ Includes railway car freight.

New Orleans has traffic with gulf and ocean ports not included in the foregoing, which is confined to river freight. The total freight movement of the port of New Orleans in 1916, not including imports and exports, aggregated 5,773,555 tons, and in 1906, 5,699,932 tons, the foregoing comprising, in addition to the river freight movement as given above, 2,245,316 tons of shipments and receipts from gulf and ocean ports in 1916 and 1,924,484 tons in 1906. The combined figures for ocean, gulf, and river freight necessarily involve duplications, not of tonnage as handled but of merchandise, to the extent that ocean or gulf freight

received at New Orleans is transshipped up river and river freight received at New Orleans enters into outgoing gulf or ocean freight. Data are not available to show the extent of this duplication.

Accurate tonnage data are not available as to imports and exports. The value of the imports of merchandise at the customs district of New Orleans for the calendar year 1916 was \$92,041,439, and for the calendar year 1906, \$44,860,252, and the value of the exports \$266,675,755 in 1916 and \$167,988,257 in 1906, showing an increase of 105.2 per cent in value of imports and 58.7 per cent in value of exports for the period 1906-1916.

In an investigation made by the Isthmian Canal Commission into the cargo tonnage of American maritime commerce it was found that the average value of the cargo ton of exports for the Atlantic coast was \$35.98, and that the average value of the cargo ton of imports was \$62.84. Assuming that these average values held approximately for New Orleans, the imports for 1916 are estimated at 2,560,000 tons and for 1906 at 1,250,000 tons, and the exports at 4,240,000 tons for 1916 and 2,670,000 tons for 1906. Of course some of this imported and exported merchandise enters through transshipment into the statistics for domestic water traffic.

The total freight movement of New Orleans was therefore approximately 12,574,000 tons in 1916 and 9,620,000 tons in 1906.

Lighterage.—The lighterage or harbor work on the Mississippi River, not classed as freight, aggregated 2,846,800 tons in 1916 and 2,781,700 tons in 1906.

That assignable to the leading ports in 1916 was as follows:

PORT.	Lighterage or harbor work, net tons.	PORT.	Lighterage or harbor work, net tons.
Dubuque, Iowa.....	55,590	St. Louis, Mo.....	1,351,387
Clinton, Iowa.....	31,650	Cairo, Ill.....	42,869
Moline, Ill.....	37,938	Memphis, Tenn.....	29,067
Davenport, Iowa.....	31,433	Helena, Ark.....	33,600
Rock Island, Ill.....	40,000	Greenville, Miss.....	255,403
Quincy, Ill.....	28,755	Baton Rouge, La.....	41,805
Alton, Ill.....	83,167	New Orleans, La.....	414,089

In 1906 there was reported for St. Louis 969,002 tons of lighterage or harbor work; for Cairo, 14,600 tons; Memphis, 195,000 tons; Greenville, 89,000 tons; Baton Rouge, 42,400 tons; and for New Orleans, 107,500 tons.

Passengers.—The number of passengers carried on the Mississippi River itself was 9,865,237 in 1916, as compared with 8,345,686 in 1906, an increase of 1,519,551, or 18.2 per cent. The great bulk of the passenger traffic was on the lower Mississippi south from St. Louis. On this section, classed as the lower Mississippi, was carried 76.7 per cent of the total number of passengers for the entire river in 1916, as compared with 83 per cent in 1906. Passenger traffic by ferryboats constituted 77.6 per cent in 1916 and

81.4 per cent in 1906. Of the 2,214,253 passengers carried on boats other than ferries in 1916, 1,145,252 were regular and 1,069,001 excursion passengers. The corresponding figures for 1906 are 614,640 and 934,876, respectively. The regular passenger traffic on the Mississippi remained practically the same as it was 10 years ago. The through passenger business, once so famous, no longer exists, and while some packet lines are still engaged in the transportation of passengers this traffic is limited in the main to local movements or to excursion business.

Minnesota.—The Minnesota River is an affluent of the Mississippi between Minneapolis and St. Paul. It is navigable for small steamboats for about 50 miles from its mouth during high water. No freight traffic was reported for the river in 1916 by boats of 5 tons net register. In 1906 the freight traffic for the river, shipments and receipts the same, was 420 tons.

The passenger traffic on this river shows a falling off from 53,600 in 1906 to 6,800 in 1916, a decrease of 46,800, or 87.3 per cent. In 1906 all passengers carried were excursion, but in 1916, 6,000 were reported as regular and 800 as excursion passengers. Only one gasoline boat of 7 tons net register was engaged in the passenger traffic on this river.

St. Croix.—The St. Croix joins the Mississippi on the left about 27 miles below St. Paul. Navigation is interrupted by the St. Croix Falls about 55 miles from its mouth. The freight shipments reported for the river in 1916 were 30 tons and the receipts 30 tons, compared with 50 tons of shipments and 550 tons of receipts in 1906.

The passenger traffic in 1916 was 8,052, composed of 5,876 regular, 1,896 ferry, and 280 excursion passengers. There were 11,968 passengers transported on the St. Croix River in 1906, all on freight and passenger boats.

Rock.—The Rock River of Illinois joins the Mississippi about 3 miles below Rock Island. Navigation is partly obstructed by rapids, and only a small amount of freight was reported for the river in 1916; shipments, 29 tons, and no receipts. No freight was reported in 1906.

Freight and passenger boats carried 3,200 passengers in 1916. None were reported for 1906.

Des Moines.—The Des Moines River of Iowa joins the Mississippi 3 miles below Keokuk. It is navigable for steamers to Des Moines. No freight or passenger traffic was reported for 1916 or 1906.

Illinois.—The Illinois River, formed by the junction of the Des Plaines and Kankakee Rivers, is 273 miles long and navigable for its entire length. It is connected with the South Branch of the Chicago River by the Illinois & Michigan Canal from La Salle, and by the Chicago Drainage Canal which joins the waters of the Des Plaines at Lockport.

The freight shipments from the river ports and landings in 1916 were 125,852 tons, and the receipts 114,232 tons, both including 47,462 tons of grain. In

1906 the shipments were 105,826 tons and the receipts 105,002. The traffic is chiefly local.

Peoria had a freight movement of 12,855 tons in 1916 and 29,277 tons in 1906, and Pekin 42,423 tons in 1916 and 10,050 tons in 1906. Lighterage or harbor work at Peoria to the amount of 130,625 tons was reported in 1916.

The number of passengers carried on the Illinois River in 1916 was 240,175, as compared with 455,935 in 1906, a decrease of 215,760, or 47.3 per cent. Excursion business made up the great bulk of the passenger traffic both in 1916 and 1906. In the former year it represented 68.7 per cent and in the latter year 88.1 per cent. Several packet boats operate on the river, some to St. Louis, carrying both regular and excursion passengers. A ferry makes daily trips between La Salle and Ottawa, operating three small gasoline boats, which carried 36,000 regular and 5,500 excursion passengers during 1916. A number of yachts are used on the river both for fishing and pleasure.

Missouri.—The Missouri River joins the Mississippi 3 miles below Alton, Ill., and about 18 miles above St. Louis. It is formed by the confluence of the Jefferson, Gallatin, and Madison Rivers or forks in Montana. It is navigable for steamboats to Fort Benton, Mont., at high water, 2,300 miles from its mouth, and to the mouth of the Yellowstone, at Buford, N. Dak., at low water. The chief towns, in descending order, are Great Falls and Fort Benton, Mont.; Bismarck, N. Dak.; Pierre and Yankton, S. Dak.; Sioux City and Council Bluffs, Iowa; Omaha and Nebraska City, Nebr.; St. Joseph, Mo.; Atchison, Leavenworth, and Kansas City, Kans.; and Kansas City and Jefferson City, Mo.

The freight commerce of the Missouri, inclusive of its tributaries, aggregated, in 1916, 200,729 tons in shipments and 207,287 tons in receipts, of which tonnage the Osage contributed 7,962 tons and the Gasconade 4,132 tons, the river commerce of these tributaries being local and the shipments and receipts equal in amounts. The chief commodities, aside from package or miscellaneous merchandise, were stone, sand, etc., and grain.

In 1906 the shipments for the river and its tributaries were 1,046,020 tons and the receipts 1,050,504 tons, the figures showing a decrease of a little over 80 per cent in freight traffic for 1916 as compared with 1906.

The only port on the river for which freight is separately given is Kansas City, Mo., which in 1916 had a freight movement of 19,562 tons and in 1906 a total of 645,954 tons, of which 250 tons were shipments and 645,704 tons receipts, stone, sand, etc., representing 645,064 tons. This port is credited with 747,031 tons of lighterage or harbor work, sand and gravel, in 1916, and with but 5,000 tons in 1906. Apparently the sand and gravel appearing as lighterage or harbor work in 1916 was classed as freight in 1906.

The lighterage or harbor work credited to the river and its tributaries in 1916 aggregated 1,047,619 tons, inclusive of that at Kansas City, and in 1906, 19,485 tons.

The passenger traffic of the Missouri is insignificant. There is no through traffic from its source to the Mississippi. All passenger traffic is local. The number of passengers carried on the river, including its tributaries, the Osage and Gasconade, aggregated 347,339 in 1916, as compared with 382,040 in 1906. Since 1906 there has been a large decline in the number of passengers carried on freight and passenger vessels. This class of boats carried 165,201 passengers in 1906 and only 70,034 in 1916, a decrease of 95,167, or 57.6 per cent, and most of this traffic in 1916 was excursion passenger traffic, one large vessel carrying 38,712 in and around Kansas City Harbor. Ferryboat traffic formed 69.2 per cent of the passenger business in 1916 and 56.8 per cent in 1906. Nearly all of the ferry traffic was done by small-tonnage gasoline boats, which operated, to a large extent, on the upper Missouri and Yellowstone Rivers.

Unrigged craft, operating as ferries and handled by pulley and cable, carried 35,630 passengers across river at various points on the Missouri and its tributaries. One boat of this character located at Culbertson, Mont., carried over 60 per cent of the total number of passengers moved by this kind of craft.

During 1906 steamboat traffic on the Osage River was carried on principally by three small packets, which, in addition to freight, carried 1,500 passengers. In 1916 only one vessel, a tug and towing boat, was in operation on this river and carried 1,100 passengers.

Three packets carrying 597 passengers were in operation on the Gasconade River in 1906. In 1916 one packet company operated two small boats, one carrying passengers a distance of 40 miles and the other doing ferry service only. The aggregate number of passengers carried by these two boats was 10,020.

Hatchie.—Descending the Mississippi and passing the Ohio (for which see above) the next affluent for which water-borne traffic is reported is the Hatchie or Big Hatchie of Tennessee, for which in 1916 freight shipments were reported to the amount of 4,710 tons and receipts 95 tons. No freight shipments or receipts were reported for the river in 1906, and no passenger traffic for either 1906 or 1916.

St. Francis.—This river enters the Mississippi 8 miles above Helena, Ark., and is navigable for about 150 miles. River shipments and receipts each amounted to 6,110 tons in 1916. The L'Anguille, an affluent of the St. Francis, reported shipments and receipts each 384 tons, making for the St. Francis and its tributary a total of 6,494 tons for both shipments and receipts. In 1906 there were 58,902 tons of shipments, all outgoing lumber.

Passenger traffic on the St. Francis River and the L'Anguille is done by small gasoline boats owned

mostly by farmers living along the banks of the rivers. The entire number of passengers carried in 1916 was only 2,627, of which 400 were carried on the L'Anguille near Marked Tree, Ark.

White and Black of Arkansas.—The White River is navigable for steamboats to Batesville, about 301 miles from its mouth. The Black, which enters the White at Jacksonport, is navigable for small steamboats for 133 miles.

The freight shipments reported for the White in 1916 amounted to 89,652 tons and the receipts to 88,621 tons, and for the Black, the shipments were 28,767 tons and receipts 24,218 tons. The corresponding figures for 1906 are: White, shipments 43,933 tons, receipts 25,433 tons; and Black, shipments 20,059 tons, receipts 20,049 tons.

In 1916 there were 27,030 passengers carried on these two rivers, mostly by small gasoline boats and unrigged craft handled by pulley and cable.

Arkansas.—Small steamboats can ascend the Arkansas as far as Wichita, Kans., a distance of 600 miles, except during low water. The freight shipments in 1916 were but 26,751 tons, of which more than two-thirds were sand, stone, etc., and receipts 27,361 tons. In 1906 the shipments were 24,994 tons and receipts 35,871 tons.

Little Rock had a freight movement of 3,495 tons in 1916 and 5,476 in 1906, and Pine Bluff a freight movement of 25,655 tons in 1916 and 11,393 tons in 1906.

Passengers carried on the Arkansas and its tributaries in 1916 numbered 47,531, as compared with 75,370 in 1906, a decrease of 27,839, or 36.9 per cent. A very large proportion of the passenger traffic in 1906 was done by ferryboats, while in 1916 all of the passengers except 700 were carried on ferries and on unrigged craft handled by pulley and cable.

Yazoo and Sunflower.—The Yazoo, the most important affluent in the state of Mississippi, enters the Mississippi River at Vicksburg and is about 178 miles long and navigable by steamboats throughout its course. The Sunflower, with a length of about 216 miles, is the chief affluent of the Yazoo. Collectively, the freight shipments in 1916 were 181,385 tons and the receipts 186,285 tons, lumber constituting approximately one-fourth; the shipments and receipts on the Sunflower contributed 60,000 tons.

In 1906 the shipments reported for the Yazoo aggregated 108,357 tons and the receipts 62,325 tons.

Passenger traffic on the Yazoo and its tributary, the Sunflower River, in 1916 was carried by one steam vessel operating between Vicksburg and Greenwood, Miss., and several unrigged craft handled by pulley and cable. There were 5,280 passengers in 1916 and 2,284 in 1906.

Ouachita and Black of Louisiana, Tensas, and Macon Bayou.—The Ouachita, or Washita, is known below the junction of the Tensas as the Black, the latter being an affluent of the Red. It also connects with

the Mississippi through the Tensas series of bayous, Macon Bayou being one of the series. It is navigable to Camden, Ark., about 350 miles from the Red. The Tensas is about 240 miles long and Macon Bayou about 150 miles, and navigable for the greater part.

The freight traffic on these rivers and bayous is local. In 1916 the shipments on the Ouachita and Black of Louisiana amounted to 42,659 tons and on the Tensas and Macon Bayou to 200 tons. In 1906 the shipments on the Ouachita and Black were 25,136 tons and on the Tensas and Macon Bayou 4,969 tons.

Red.—The Red River is navigable for steamboats to Shreveport, 350 miles from its mouth, and at high water several hundred miles farther. The freight traffic in 1916 aggregated 6,560 tons, shipments and receipts the same, compared with shipments of 14,417 tons and deliveries of 8,481 tons in 1906. In 1906 a freight movement of 4,026 tons was reported for Shreveport, the principal port on the river.

Atchafalaya.—The Atchafalaya is an outlet of the Red or Mississippi, with a discharge into the gulf at

Atchafalaya Bay. Its length is about 170 miles, of which the greater part is navigable for steamboats. Freight traffic thereon is local and but 1,000 tons was reported in 1916.

Lafourche.—Bayou Lafourche is an outlet of the Mississippi, its head being at Donaldsonville, La. It is 107 miles long and navigable for steamboats. The freight traffic thereon in 1916 was approximately 5,200 tons.

No attempt is made to discuss passenger traffic on the above rivers, owing to the incomplete classification of the schedule.

FREIGHT MOVEMENT—BY PORTS.

The freight movement for the chief ports on the Mississippi River and its tributaries, the same comprising shipments and receipts, is given in Table 25 for 1916 and 1906. The ports are ranked according to the total freight tonnage, shipments, and receipts combined.

TABLE 25.—FREIGHT MOVEMENT (TONS OF 2,000 POUNDS), BY PORTS: 1916 AND 1906.

RIVER SYSTEM AND PORT.	TOTAL FREIGHT MOVEMENT.		SHIPMENTS.		RECEIPTS.		PER CENT OF INCREASE. ¹	
	1916	1906	1916	1906	1916	1906	Shipments.	Receipts.
Total.....			27,962,583	² 19,531,093	27,962,583	² 19,531,093	(³)	(³)
River systems:								
Ohio.....			15,572,149	15,226,805	15,127,059	14,036,946	(³)	(³)
Upper Mississippi.....			754,451	1,758,101	1,753,501	1,753,501	-57.1	-57.5
Lower Mississippi.....			11,635,983	2,546,187	12,090,381	3,740,646	(³)	(³)
Ports:								
Pittsburgh, Pa.....	6,727,289	6,854,575	238,396	493,702	6,488,893	6,360,873	-51.7	2.0
New Orleans, La.*.....	3,528,239	1,036,613	⁴ 1,639,975	58,483	⁴ 1,888,264	978,130	(³)	(³)
Baton Rouge, La.....	2,086,786	15,508	⁴ 1,024,820	4,896	⁴ 1,061,966	10,612	(³)	(³)
Cincinnati, Ohio.....	1,411,149	2,363,215	158,410	231,368	1,252,739	2,131,847	-31.5	-41.2
Vicksburg, Miss.....	778,148	375,454	⁴ 214,769	232,061	⁴ 563,379	143,393	(³)	(³)
Paducah, Ky.....	⁴ 754,552	239,808	⁴ 325,643	48,977	⁴ 428,909	190,831	(³)	(³)
Louisville, Ky.....	369,614	1,203,727	108,927	86,772	260,687	1,116,955	25.5	-76.7
Helena, Ark.....	⁴ 342,213	60,463	⁴ 173,112	2,052	⁴ 169,101	58,411	(³)	(³)
Memphis, Tenn.....	287,047	662,308	80,419	395,494	206,623	266,814	-79.7	-22.6
Evansville, Ind.....	251,549	416,133	56,210	57,762	195,339	358,371	-2.7	-45.5
St. Louis, Mo.....	154,813	743,981	44,104	77,901	110,709	666,080	-43.4	-83.4
Madison, Ind.....	135,382	107,053	52,838	21,495	82,544	85,558	145.8	-3.5
Davenport, Iowa.....	99,667	95,163	5,022	11,735	94,645	83,428	-57.2	13.4
Natchez, Miss.....	⁴ 77,657	56,966	⁴ 32,282	14,531	⁴ 45,375	42,435	(³)	(³)
Charleston, W. Va.....	74,581	35,650	39,423	21,430	35,158	17,220	84.0	104.2
Cairo, Ill.....	66,886	247,239	12,910	13,130	53,976	234,109	-1.7	-76.9
Greenville, Miss.....	61,564	89,519	11,233	16,189	50,331	73,330	-30.6	-31.4
Parkersburg, W. Va.....	60,848	56,547	36,224	35,649	24,624	20,898	1.6	17.8
Moline, Ill.....	58,363	56,336	301	2,219	58,062	54,117	-86.4	7.3
Nashville, Tenn.....	56,251	99,193	16,981	11,920	39,270	87,273	42.5	-55.0
Chattanooga, Tenn.....	51,760	91,061	21,348	19,250	30,412	71,811	10.9	-57.6
Burlington, Iowa.....	50,201	35,777	7,500	4,856	42,701	30,921	54.4	38.1
Pekin, Ill.....	42,423	10,050	7,300	.....	42,123	10,050	.....	319.1
Bowling Green, Ky.....	39,541	50,367	4,846	13,119	34,695	37,248	-63.1	-6.9
Decatur, Ala.....	37,851	81,078	8,595	18,003	29,256	63,075	-52.3	-53.6
Clinton, Iowa.....	37,127	37,503	1,325	1,898	35,802	35,605	-30.2	0.6
Muscataine, Iowa.....	36,054	21,934	3,119	1,392	32,935	20,542	124.1	60.3
Marietta, Ohio.....	29,491	33,480	16,043	15,883	13,448	17,597	1.0	-23.6
Wheeling, W. Va.....	28,296	161,550	9,354	42,360	18,942	119,190	-77.9	-84.1
Pine Bluff, Ark.....	25,655	11,393	2,975	5,902	22,680	5,491	-49.6	313.0
Burnside, Ky.....	25,301	32,175	12,653	4,708	12,648	27,467	168.8	-54.0
All other ports.....			23,602,526	17,565,956	14,536,342	6,111,411	34.4	137.9
Ohio system.....			14,466,258	14,104,407	6,179,495	3,330,732	2.6	85.5
Upper Mississippi system.....			736,884	1,736,001	438,875	1,518,838	-57.6	-71.1
Lower Mississippi system.....			8,399,384	1,725,548	7,917,972	1,261,841	386.8	527.5
*New Orleans:								
Mississippi River.....	3,528,239	3,775,448	1,639,975	1,542,671	1,888,264	2,232,777	6.3	-15.4
Railway car freight.....	3,037,970	2,738,835	1,437,624	1,484,188	1,600,346	1,254,647	-3.1	27.6
Other.....	490,269	1,036,613	202,351	58,483	287,918	987,130	246.0	-70.8
Ocean, coast, and gulf.....	2,245,316	1,924,484	995,621	741,621	1,249,695	1,182,803	34.2	5.7
Domestic.....	5,773,555	5,699,932	2,635,596	2,284,292	3,137,959	3,415,640	15.4	-8.1
Foreign imports and exports (estimated).....	6,800,000	3,920,000	4,240,000	2,670,000	2,560,000	58.8	58.8	104.8
Total.....	12,573,555	9,619,932	6,875,596	4,954,292	5,697,959	4,665,640	38.8	22.7

¹ A minus sign (-) denotes decrease.

² Does not include 6,905,597 tons carried in railway cars; treated as freight in 1916.

³ Not comparable.

⁴ Includes railway car freight.

The statistics for New Orleans, Baton Rouge, Vicksburg, Paducah, Helena, and Natchez, as given in the table, are not comparable for the two years on account of the inclusion of car freight in the figures for 1916.

The table shows the total freight movement for the port of New Orleans, comprising Mississippi River freight; that of the ocean and gulf division, including

freight shipped to and received from ports of the Pacific via Panama Canal; and the estimated tonnage of imports and exports.

Table 26 shows the freight and harbor work tonnage separately and combined for the ports reporting a total of over 100,000 tons handled in 1916, ranked according to total tonnage.

TABLE 26.—FREIGHT AND HARBOR WORK FOR PORTS REPORTING IN 1916 A TOTAL OF OVER 100,000 TONS: 1916 AND 1906.

PORT AND CENSUS YEAR.	Total (tons of 2,000 pounds).	Freight carried (tons of 2,000 pounds).	Harbor work.	PORT AND CENSUS YEAR.	Total (tons of 2,000 pounds).	Freight carried (tons of 2,000 pounds).	Harbor work.
Pittsburgh, Pa.:				Greenville, Miss.:			
1916.....	9,207,989	6,727,289	2,480,700	1916.....	316,964	61,564	255,400
1906.....	8,956,697	6,854,575	2,102,122	1906.....	178,519	39,519	89,000
New Orleans, La.:				Memphis, Tenn.:			
1916.....	3,942,339	3,528,239	414,100	1916.....	316,147	287,047	29,100
1906.....	1,144,113	1,036,613	107,500	1906.....	1,857,308	662,308	195,000
Baton Rouge, La.:				Charleston, W. Va.:			
1916.....	2,128,586	2,086,786	41,800	1916.....	199,081	74,581	124,500
1906.....	57,908	15,508	42,400	1906.....	1,111,050	38,650	72,400
Cincinnati, Ohio:				Nashville, Tenn.:			
1916.....	1,737,949	1,411,149	326,800	1916.....	198,751	56,251	142,500
1906.....	2,435,215	2,363,215	72,000	1906.....	127,318	99,193	28,125
St. Louis, Mo.:				Knoxville, Tenn.:			
1916.....	1,506,213	154,813	1,351,400	1916.....	145,180	9,280	135,900
1906.....	1,712,983	748,981	969,002	1906.....	82,328	77,828	4,500
Kansas City, Mo.:				Cairo, Ill.:			
1916.....	766,562	19,562	747,000	1916.....	109,786	66,886	42,900
1906.....	650,954	645,954	5,000	1906.....	1,261,389	247,239	14,600

¹ Does not include freight ferried in railway cars.

Table 27 shows, by commodities, the shipments and receipts of freight for 1916 for ports with over 50,000 tons of freight movement. The ports are ranked according to total freight and the commodities according to total tonnage, the tonnage of shipments

and the tonnage of receipts being the same for the Mississippi River and its tributaries as a whole. The table also shows for the port of New Orleans the data for all river, ocean, and gulf domestic freight by commodities.

TABLE 27.—FREIGHT SHIPMENTS AND RECEIPTS, BY COMMODITIES AND BY PORTS, AND TOTAL FREIGHT HANDLED, BY PORTS: 1916.

PORT.	Total freight movement (tons of 2,000 pounds).	TOTAL.		COAL.		STONE, SAND, ETC.		LUMBER.		GRAIN.		IRON ORE.	
		Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.
Total.....		27,962,583	27,962,583	13,916,013	13,916,013	1,710,857	1,710,857	744,873	744,873	617,946	617,946	470,409	470,409
Pittsburgh, Pa.	6,727,289	238,396	6,488,893	5,876	6,465,479	49,172	.....	165	1,732	80	94	.....	.....
New Orleans, La.*.....	3,528,239	1,639,975	1,888,264	164,145	165,029	62,065	1,251	11,207	268,179	11,565	111,387	142,169	13,234
Baton Rouge, La.	2,086,786	1,024,820	1,061,966	.....	75,244	.....	1,500	.....	.....	.....	.....	.....	.....
Cincinnati, Ohio.....	1,411,149	158,410	1,252,739	23,156	1,134,317	70	315	5,335	4,616	955	6,350	.....	.....
Vicksburg, Miss.	778,148	214,769	563,379	64,053	21,492	1,409	.....	1,047	42,785	2,462	6,320	137	10
Paducah, Ky.	754,552	325,643	428,909	176,571	289,109	100,000	16	910	14,515	72	14,310	4	.....
Louisville, Ky.	369,614	108,927	260,687	460	144,010	.....	6,020	4,120	757	225	3,082	.....	.....
Helena, Ark.	342,213	173,112	169,101	7	1	.....	.....	5	.....	2,445	2	.....	.....
Memphis, Tenn.	287,047	80,419	206,628	23,377	114,927	11	2	3,086	7,899	11,417	2,108	.....	.....
Evansville, Ind.	251,549	56,210	195,339	.....	48,306	1,620	60	264	2,585	300	8,050	.....	.....
St. Louis, Mo.	154,813	44,104	110,709	.....	54,897	.....	927	30	3,175	402	1,782	.....	.....
Madison, Ind.	135,382	52,838	82,544	527	15,213	.....	12,000	5,327	4,050	13,037	2,334	.....	.....
Davenport, Iowa.	99,667	5,022	94,645	500	.....	.....	94,350	.....	.....	.....	.....	.....	.....
Natchez, Miss.	77,657	32,282	45,375	184	11,319	810	.....	1,506	370	34	3,500	.....	.....
Charleston, W. Va.	74,581	39,423	35,158	.....	.....	15	50	470	544	4,662	2,410	.....	500
Cairo, Ill.	66,886	12,910	53,976	.....	12,408	927	1,000	184	17,534	2,285	7,306	.....	.....
Greenville, Miss.	61,564	11,233	50,331	1,330	41,800	.....	.....	10	550	2,221	.....	.....	.....
Parkersburg, W. Va.	60,848	36,224	24,624	40	9,000	.....	8	9,710	941	103	115	.....	.....
Moline, Ill.	58,363	301	58,062	250	.....	.....	58,062	15	.....	.....	.....	.....	.....
Nashville, Tenn.	56,251	16,981	39,270	110	.....	.....	.....	100	6,539	60	20,335	.....	.....
Chattanooga, Tenn.	51,760	21,348	30,412	.....	110	.....	1,063	.....	8,252	337	14,346	.....	.....
Burlington, Iowa.	50,201	7,500	42,701	.....	.....	.....	42,208	.....	123	.....	22	.....	.....
All other ports.....		23,661,736	14,778,871	13,455,427	5,313,352	1,494,758	1,492,025	701,382	359,727	565,284	413,593	328,099	456,665
*New Orleans—Total river, ocean, and gulf (domestic). ..	5,773,555	2,635,596	3,137,959	168,626	249,399	62,245	7,950	192,175	337,308	158,428	113,780	142,294	13,234

TABLE 27.—FREIGHT SHIPMENTS AND RECEIPTS, BY COMMODITIES AND BY PORTS, AND TOTAL FREIGHT HANDLED, BY PORTS: 1916—Continued.

PORT.	PIG IRON AND STEEL RAILS.		PETROLEUM AND OTHER OILS.		COTTON.		CEMENT, BRICK, AND LIME.		FRUITS AND VEGETABLES.		FLOUR.	
	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.
Total.....	255,615	255,615	245,930	245,930	180,563	180,563	175,724	175,724	119,297	119,297	99,513	99,513
Pittsburgh, Pa.....	132,226	359	652	3,677			20	20	160	316	140	67
New Orleans, La.*.....	130		140,383	30,225	7,865	90,803	3,576		3,305	3,754	4,495	300
Baton Rouge, La.....			39,605									
Cincinnati, Ohio.....	10,150	5,100	4,247	1,336		370	9,163	13,445	10,650	15,100	3,840	1,100
Vicksburg, Miss.....	1,615		783	27	3,152	3,230	4,880	121	5,239	12	3,767	9
Paducah, Ky.....	84		3,093	17		5,474	2,106	693	157	6,657	6,639	500
Louisville, Ky.....	5,000	10,000	1,129	1,399			3,625	305	690	3,295	2,279	1,065
Helena, Ark.....			91		11	1,012			1		679	1
Memphis, Tenn.....	7		1,111	766	7	28,363	1,990	1,223	2,054	392	2,876	430
Evansville, Ind.....			1,409	46			1,167		72	525	4,653	3,162
St. Louis, Mo.....		130	584	382		732	1,505	755	723	58	944	81
Madison, Ind.....			502	1,131	20		1,950	7,560	921	1,516	4,535	390
Davenport, Iowa.....												
Natchez, Miss.....			417		5,445	8,024	117		75	800	1,035	2,787
Charleston, W. Va.....	25	120	1,398	2,042			10,959	1,274	3,243	2,404	7,175	2,695
Cairo, Ill.....			167	277								
Greenville, Miss.....			362		1,000	560			815	197	581	789
Parkersburg, W. Va.....	565		220	182			520	1,000	3		2,129	600
Moline, Ill.....							1,661	59	103	1,066	7,722	104
Nashville, Tenn.....			96				1,071		33	204	1,160	
Chattanooga, Tenn.....			4			5,454	7,245				7,274	
Burlington, Iowa.....								6		32		
All other ports.....	105,813	239,906	49,677	204,423	163,063	36,541	123,836	149,009	91,053	82,969	37,590	85,433
*New Orleans—Total river, ocean, and gulf (domestic).....	5,708	648	216,929	175,672	37,986	91,266	9,765	9,092	19,979	205,777	75,868	318

PORT.	TOBACCO.		CANNED GOODS.		PHOSPHATE AND FERTILIZER.		NAVAL STORES.		ICE.		MISCELLANEOUS MERCHANDISE.	
	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.
Total.....	75,393	75,393	72,820	72,820	68,458	68,458	18,515	18,515	14,302	14,302	9,176,355	9,176,355
Pittsburgh, Pa.....	25	16	356	106	45	30	15				49,464	16,997
New Orleans, La.*.....	21	164	11,968	949	2,540		50		695		1,073,798	1,202,989
Baton Rouge, La.....											985,215	985,222
Cincinnati, Ohio.....	9,800	10,450	9,470	2,720	5,350	1,610			270	165	65,954	55,745
Vicksburg, Miss.....	53	300	2,847	173	7,979	13	413		1,585		113,348	488,887
Paducah, Ky.....	1,511	9,336	2,785	1,000	1,307	25			580		29,824	87,257
Louisville, Ky.....	2,712	11,902	2,600	2,380	6,810	150			50	842	79,227	75,480
Helena, Ark.....	1		1,694	1					90		168,088	168,084
Memphis, Tenn.....	18	2	6,957	264	400	311	6		1,017		26,085	49,941
Evansville, Ind.....	51	515	485	120	210	25			110		45,869	131,945
St. Louis, Mo.....	24	36	651	76	405	503					38,836	47,175
Madison, Ind.....	4,644	3,740	2,830	3,700	80	2,000			324	239	18,141	28,671
Davenport, Iowa.....											4,522	295
Natchez, Miss.....	1	201	2,056	575	100				500		20,002	17,799
Charleston, W. Va.....	4,356	1,266	1,198	1,896	790	1,130			210	1,000	4,922	17,827
Cairo, Ill.....		1,500	1,940	868	86	135			25		5,588	11,208
Greenville, Miss.....	1		290	500					585	500	2,782	4,821
Parkersburg, W. Va.....	18	8,515	2,581	108	10	25	3	5	1,230	8	12,258	4,488
Moline, Ill.....									15			
Nashville, Tenn.....		1,320	20		3,306						11,025	10,872
Chattanooga, Tenn.....		1	2,408		157						3,923	1,186
Burlington, Iowa.....									1,000		6,500	310
All other ports.....	52,157	26,129	19,686	57,384	38,883	62,501	18,028	18,510	6,016	11,548	6,410,984	5,769,156
*New Orleans—Total river, ocean, and gulf (domestic).....	950	246	18,348	21,984	14,869	16,642	3,471	135	2,061		1,505,894	1,894,468

The bulk of the freight reported under "stone, sand, etc.," was sand dredged in the neighborhood of the ports of receipt. Sand dredged within the confines of a port is classed as harbor work or lighterage and is not here included.

Table 28 presents the statistics for harbor work or lighterage by river systems for 1916 and 1906, and for

the principal rivers and ports for 1916. The tonnage is shown for coal, and for sand, gravel, stone, etc., separately and for all other merchandise combined.

Sand, gravel, stone, etc.—chiefly sand and gravel—constituted 88.3 per cent of the total harbor-work tonnage in 1916, and 90.5 per cent in 1906, and coal 4.5 per cent in 1916 and 4.6 per cent in 1906.

TABLE 28.—HARBOR WORK, BY RIVER SYSTEMS, 1916 AND 1906:
RIVERS AND PORTS, 1916.

[Tons of 2,000 pounds.]

RIVER SYSTEM, RIVER, AND PORT.	Total.	Coal.	Sand, stone, gravel, etc.	Miscel- laneous mer- chan- dise.
Aggregate:				
1916.....	12,206,800	546,600	10,775,800	884,400
1906.....	5,190,300	238,300	4,698,200	253,800
Ohio system:				
1916.....	7,380,900	94,800	6,474,700	811,400
1906.....	2,354,100		2,354,100	
Upper Mississippi system:				
1916.....	1,658,000	4,800	1,652,500	700
1906.....	482,100	3,200	478,000	900
Lower Mississippi system:				
1916.....	3,167,900	447,000	2,648,600	72,300
1906.....	2,354,100	235,100	1,866,100	252,900
Rivers, 1916:				
Ohio.....	5,684,800	79,800	4,798,500	806,500
Mississippi.....	2,846,800	447,600	2,330,500	68,700
Upper.....	472,400	600	471,600	200
Lower.....	2,374,400	447,000	1,858,900	68,500
Missouri and Osage.....	1,047,600		1,047,100	500
Tennessee.....	267,000		267,000	
Cumberland.....	178,300	4,100	171,200	3,000
Wabash.....	145,700	400	145,000	300
Illinois.....	138,000	4,200	133,800	
Kanawha.....	124,500		124,500	
All other rivers.....	1,774,100	10,500	1,758,200	5,400
Ports, 1916:				
Pittsburgh, Pa.....	2,480,700	24,200	2,456,500	
St. Louis, Mo.....	1,351,400		1,351,400	
Kansas City, Mo.....	747,000		746,500	500
Louisville, Ky.....	527,500		527,500	
New Orleans, La.....	414,100	337,800	17,800	58,500
Cincinnati, Ohio.....	326,800	15,000	311,800	
Greenville, Miss.....	255,400		255,400	
Evansville, Ind.....	232,500		232,500	
Wheeling, W. Va.....	210,000		210,000	
Marietta, Ohio.....	185,700	100	185,200	400
Huntington, W. Va.....	180,000		180,000	
Ambridge, Pa.....	158,200		158,200	
Nashville, Tenn.....	142,500		142,500	
Knoxville, Tenn.....	135,900		135,900	
Joppa, Ill.....	133,000			133,000
Chattanooga, Tenn.....	131,200		131,200	
Peoria, Ill.....	130,700		130,700	
Charleston, W. Va.....	124,500		124,500	
Steubenville, Ohio.....	123,100		123,100	
All other ports, and landings.....	4,216,600	169,500	3,355,100	692,000

PASSENGERS.

Table 29 gives the passenger statistics for 1916, 1906, 1889, and 1880, distributed by river systems. It shows the number carried by ferryboats and by all other vessels, and gives the per cent of increase for the several classes of passengers for the intervening periods.

TABLE 29.—NUMBER OF PASSENGERS, BY RIVER SYSTEMS, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916, 1906, 1889, AND 1880.

RIVER SYSTEM AND CLASS.	1916	1906	1889	1880	PER CENT OF INCREASE. ¹			PER CENT OF TOTAL.			
					1906-1916	1889-1906	1880-1889	1916	1906	1889	1880
Total.....	17,599,378	14,122,241	10,858,894	6,728,067	24.6	30.1	61.4	100.0	100.0	100.0	100.0
Ferryboats.....	12,390,740	10,022,612	8,474,646	5,199,984	23.6	18.3	63.0	70.4	71.0	78.0	77.3
All other vessels.....	5,208,638	4,099,629	2,384,248	1,528,083	27.1	71.9	56.0	29.6	29.0	22.0	22.7
Ohio system.....	6,967,635	4,776,088	6,503,143	3,961,798	45.9	-26.6	64.1	100.0	100.0	100.0	100.0
Ferryboats.....	4,365,151	2,951,908	4,996,549	3,000,862	47.9	-40.9	66.5	62.6	61.8	76.8	75.7
All other vessels.....	2,602,484	1,824,180	1,506,594	960,936	42.7	21.1	56.8	37.4	38.2	23.2	24.3
Upper Mississippi system.....	2,959,825	2,333,084	1,821,734	1,380,912	26.9	28.1	31.9	100.0	100.0	100.0	100.0
Ferryboats.....	1,547,144	890,836	1,482,984	1,026,182	73.7	-39.9	44.5	52.3	38.2	81.4	74.3
All other vessels.....	1,412,681	1,442,248	338,750	354,730	-2.1	325.8	-4.5	47.7	61.8	18.6	25.7
Lower Mississippi system.....	7,671,918	7,013,069	2,534,017	1,385,357	9.4	176.8	82.9	100.0	100.0	100.0	100.0
Ferryboats.....	6,478,445	6,179,868	1,895,113	1,172,940	4.8	209.8	70.1	84.4	88.1	78.7	84.7
All other vessels.....	1,193,473	833,201	538,904	212,417	43.2	54.6	153.7	15.6	11.9	21.3	15.3

¹ A minus sign (-) denotes decrease.

Of the 17,599,378 passengers reported in 1916, 79.4 per cent were carried by ferryboats. On the Lower Mississippi system only a little over 15 per cent of the passenger movement was on vessels other than ferryboats. The period of greatest increase in the number of passengers carried by ferryboats was between 1880 and 1889, when the increase was 63 per cent, as compared with 18.3 per cent between 1889 and 1906 and 23.6 per cent between 1906 and 1916. The largest passenger traffic was on the Lower Mississippi system, with 43.6 per cent of the total, as against 39.6 per cent on the Ohio system and 16.8 per cent on the Upper Mississippi system.

Table 30 gives the passenger statistics in detail for 1916 by class of vessels, by river systems, and by character of passengers, regular or excursion.

The passengers are credited to the river on which the chief port or home port of the vessel is located, and it therefore follows that in the case of boats plying on more than one river, the river on which the home port is located has received credit for all passengers, even though there were local passengers between landings on another river.

The total number of passengers in 1916, 17,599,378, is 3,477,137, or 24.6 per cent greater than in 1906. The table shows that 12,390,740, or 70.4 per cent of the total number of passengers, were carried by ferryboats, a distinctly local movement. Of the other classes of vessels engaged in passenger traffic, freight and passenger vessels carried 23.2 per cent, barges 5.7 per cent, and towing vessels seven-tenths of 1 per cent. Of the total number, 15,627,136, or 88.8 per cent, were regular and 1,972,242 were excursion passengers. The bulk of the passenger traffic on the Mississippi River and its tributaries was on the Mississippi and Ohio Rivers. The former river handled 56.1 per cent of all passenger traffic, the latter river 32.6 per cent, leaving only 11.3 per cent for all the other rivers of this division.

TABLE 30.—NUMBER OF PASSENGERS, BY CLASS OF VESSELS AND BY RIVER SYSTEMS AND RIVERS: 1916.

RIVER SYSTEM AND RIVER.	Aggregate.	FREIGHT AND PASSENGER VESSELS.			FERRYBOATS.			TUGS AND OTHER TOWING VESSELS.			BARGES.		
		Total.	Regular.	Excursion.	Total.	Regular.	Excursion.	Total.	Regular.	Excursion.	Total.	Regular.	Excursion.
Aggregate.....	17,599,378	14,085,821	2,278,769	1,807,052	12,390,740	12,361,404	9,336	119,870	60,075	59,795	1,002,947	906,888	96,059
System:													
Lower Mississippi aystem.....	7,671,918	1,113,636	798,844	314,792	6,478,445	6,478,445	.....	21,460	19,710	1,750	58,377	55,887	2,490
Ohio aystem.....	6,967,635	1,733,708	1,093,658	640,050	4,365,151	4,362,475	2,676	68,516	35,671	32,845	800,260	792,341	7,919
Upper Mississippi aystem.....	2,959,825	1,238,477	386,267	852,210	1,547,144	1,540,484	6,660	29,894	4,694	25,200	144,310	68,660	85,650
River:													
Mississippi.....	9,865,237	2,031,134	1,073,058	958,076	7,650,984	7,650,984	.....	48,208	22,408	25,800	134,911	49,786	85,125
Upper.....	2,294,884	953,712	307,895	645,817	1,204,849	1,204,849	.....	27,068	3,118	24,550	108,655	23,530	85,125
Lower.....	7,570,353	1,077,422	765,163	312,259	6,446,135	6,446,135	.....	20,540	19,290	1,250	26,256	26,256	.....
Ohio.....	5,731,660	1,555,724	967,701	588,023	4,070,912	4,068,236	2,676	53,165	20,400	32,765	51,859	47,259	4,600
Monongahela.....	354,586	.....	.....	.....	.....	.....	.....	.....	.....	.....	354,586	354,586	.....
Missouri, Gasconade, and Osage.....	347,339	70,034	25,228	44,806	240,449	239,289	1,160	1,226	576	650	35,630	35,130	500
Tennessee, French Broad, and Hiwassee.....	277,205	49,472	36,307	13,165	58,729	58,729	.....	14,503	14,503	.....	154,501	154,501	.....
Cumberland.....	247,456	51,106	27,637	23,469	141,810	141,810	.....	540	540	.....	54,000	54,000	.....
Illinois.....	240,175	197,675	38,068	159,607	41,500	36,000	5,500	1,000	1,000	.....	.....	.....	.....
Kanawha.....	135,313	11,922	7,410	4,512	51,700	51,700	.....	.....	.....	.....	71,691	71,691	.....
Little Kanawha.....	63,149	23,306	22,181	1,125	.....	.....	.....	183	103	80	39,660	39,660	.....
Yellowstone.....	58,000	.....	.....	.....	58,000	58,000	.....	.....	.....	.....	.....	.....	.....
Big Sandy.....	56,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	56,000	56,000	.....
Wabash.....	48,090	2,790	2,015	775	42,000	42,000	.....	.....	.....	.....	3,300	500	2,800
Arkansas.....	47,531	700	700	.....	32,310	32,310	.....	.....	.....	.....	14,521	12,531	1,990
White.....	27,030	13,910	12,454	1,456	.....	.....	.....	620	120	500	12,500	12,000	500
Green.....	20,930	20,605	20,405	200	.....	.....	.....	125	125	.....	200	.....	200
Meramec.....	18,000	18,000	18,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Muskogum.....	15,000	15,000	9,000	6,000	.....	.....	.....	.....	.....	.....	.....	.....	.....
Allegheny.....	14,219	700	.....	700	.....	.....	.....	.....	.....	.....	13,519	13,519	.....
St. Croix.....	8,052	6,156	5,876	280	1,896	1,896	.....	.....	.....	.....	.....	.....	.....
Minnesota.....	6,800	6,800	6,000	800	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yazoo.....	5,280	180	180	.....	.....	.....	.....	.....	.....	.....	5,100	5,100	.....
Kentucky.....	3,825	2,881	800	2,081	.....	.....	.....	.....	.....	.....	944	625	319
Rock.....	3,200	3,200	3,200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Francis.....	2,627	2,327	1,250	1,077	.....	.....	.....	300	300	.....	.....	.....	.....
All other.....	2,674	2,199	1,299	900	450	450	.....	.....	.....	.....	25	.....	25
Lower Mississippi system.....	1,097	1,097	1,097	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio system.....	202	202	202	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Upper Mississippi aystem.....	1,375	900	.....	900	450	450	.....	.....	.....	.....	25	.....	25

¹ Includes 970 excursion passengers carried on yachts, Upper Mississippi aystem 200, Ohio system 770.

In addition to the regular ferryboat traffic there was a large number of small-tonnage unrigged craft, some of which carried excursion passengers to and from various resorts on the rivers, while others transferred farmers and laborers from shore to shore. The boats carrying excursionists were usually propelled by small motor boats of less than 5 tons, while the boats going across stream only were as a general rule hauled backward and forward by means of wire or rope cable stretched from shore to shore. This latter class of boats carried 1,002,947 passengers in 1916. The transferring of passengers across stream in small unrigged craft was the only kind of passenger traffic in boats of 5 tons net register on the Monongahela River in 1916. This kind of service was also quite extensive on the Tennessee and some of the other smaller rivers. Most of the passengers were of the class designated as regular passengers, farmers, laborers employed in coal mines, and workmen in manufacturing establishments located at points on the rivers. A little over 96,000 were excursion passengers, of which 85,125 were on the upper Mississippi River.

FERRYBOATS.

Statistics for the ferries for the years 1916, 1906, and 1889 are presented in Table 31.

TABLE 31.—FERRYBOATS, WITH PER CENT OF INCREASE: 1916, 1906, AND 1889.

	1916	1906 ¹	1889	PER CENT OF INCREASE. ²	
				1906-1916	1889-1906
Number of vessels.....	213	168	163	28.3	1.8
Gross tonnage.....	11,263	22,180	18,593	-49.2	19.3
Value of vessels.....	\$1,014,950	\$1,776,360	\$1,056,250	-42.9	68.2
Gross income.....	\$1,060,470	\$1,553,121	\$1,196,817	-31.7	29.8
From passengers.....	\$631,112	\$498,747	.....	26.5	.....
From all other sources.....	\$429,357	\$1,054,374	.....	-59.3	.....
Number employed on vessels.....	672	699	893	-18.2	-21.7
Wages.....	\$346,116	\$413,553	\$456,676	-16.3	-9.4
Number of passengers.....	12,390,740	10,022,612	8,474,646	23.6	18.3

¹ Includes 14 railway transfers of 8,127 gross tonnage which were treated in 1916 as freight and passenger vessels.

² A minus sign (-) denotes decrease.

³ Includes 407,218 passengers carried on railway ferry steamers.

⁴ Includes 350,282 passengers carried on railway ferry steamers.

While the number of passengers reported in 1916 is an increase of 2,368,128, or 23.6 per cent over 1906, and of 3,916,094, or 46.2 per cent over 1889, the percentage they constitute of all passengers for all vessels reported was slightly less in 1916 than in 1906 and 1889, viz, 70.4 per cent in 1916, as compared with 71 per cent in 1906 and 78 per cent in 1889. The income from "all other sources" is for the ferrying of wagons, teams, and live stock. This item which was largely in excess of passenger income in 1906 formed but 40.5 per cent of the total in 1916. The distribution of the ferries by river systems is given in Table 32.

TABLE 32.—FERRYBOATS, BY RIVER SYSTEMS: 1916 AND 1906.

RIVER SYSTEM AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Number of passengers carried.
Total:			
1916.....	213	11,263	¹ 12,390,740
1906 ²	166	22,180	³ 10,022,612
Ohio:			
1916.....	102	3,188	4,365,151
1906.....	63	5,276	2,951,908
Upper Mississippi:			
1916.....	70	2,120	1,547,144
1906.....	51	2,408	890,836
Lower Mississippi:			
1916.....	41	5,955	6,478,445
1906.....	52	14,496	6,179,868
PER CENT OF TOTAL.			
Total:			
1916.....	100.0	100.0	100.0
1906.....	100.0	100.0	100.0
Ohio:			
1916.....	47.9	28.3	35.2
1906.....	38.0	23.8	29.5
Upper Mississippi:			
1916.....	32.9	18.8	12.5
1906.....	30.7	10.9	8.9
Lower Mississippi:			
1916.....	19.2	52.9	52.3
1906.....	31.3	65.4	61.7

¹ Includes 407,218 passengers carried on railway ferry steamers.² Includes 14 railway transfers of 8,127 tons which were treated in 1916 as freight and passenger vessels.³ Includes 350,282 passengers carried on railway ferry steamers.

The ferry passengers of the Upper Mississippi system numbered 298,449 for the Missouri River and its branches in 1916 and 1,248,695 for the Mississippi River and all other branches. This was an increase over 1906 of 81,610, or 37.6 per cent, for the former river and of 574,698, or 85.3 per cent, for the latter. The 4,365,151 ferry passengers of the Ohio system were distributed by rivers as follows: Ohio, 4,070,912; Cumberland, 141,810; Tennessee, 58,729; Kanawha, 51,700; and Wabash, 42,000. The ferry passenger traffic on the rivers of the Ohio system shows an increase over 1906 for the Ohio of 46.3 per cent and the Cumberland of 476.5 per

cent, while a decrease is shown for the Tennessee of 25.4 per cent and the Wabash of 35.6 per cent. The Kanawha was first shown separately in 1916. The ferry passengers of the Lower Mississippi system numbered 6,446,135 for the Mississippi River itself and 32,310 for the Arkansas in 1916. This is an increase for the Mississippi River of 323,962, or 5.3 per cent, and a decrease for the Arkansas of 22,020, or 40.5 per cent. Other minor tributaries which reported 3,365 ferry passengers in 1906 show no passenger traffic in 1916.

The table shows that in 1906 there were operated on the lower Mississippi 52 ferryboats with an aggregate gross tonnage of 14,496, and in 1916, 41 ferryboats with 5,955 gross tonnage, a decrease during the ten-year period 1906-1916 of 11 boats and 8,541 tons. Among the reasons for this decline was the operation of boats of less average tonnage capacity in 1916 than in 1906 and the retirement of several boats of large tonnage. For instance, one company at St. Louis, which operated nine boats in 1906 with a gross tonnage of 3,077, reported only three boats in 1916 of 1,502 gross tonnage.

The principal ferry points and the only centers or districts for which detailed statistics can be given without disclosing individual operations are New Orleans and St. Louis, the statistics for which are presented in Table 33.

This table shows a great reduction in passenger ferry traffic at St. Louis, caused, in large part, by the advent of bridges for passenger traffic at that point. The number of passengers carried by ferries at St. Louis decreased 1,260,143 since 1906. At New Orleans, where this condition does not exist, the ferry passenger traffic shows an increase since 1906 of 1,946,830, or 55.2 per cent.

TABLE 33.—FERRYBOATS, BY DISTRICTS, WITH PER CENT IN EACH DISTRICT: 1916 AND 1906.

DISTRICT.	Census year.	Number of vessels.	Gross tonnage.	Value of vessels.	GROSS INCOME.			Number employed on vessels.	Wages.	Number of passengers carried.
					Total.	Passengers.	All other sources.			
Total.....	1916	213	11,263	\$1,014,950	\$1,060,470	\$631,113	\$429,357	572	\$346,116	¹ 12,390,740
	1906	² 166	22,180	1,776,360	1,553,121	498,747	1,054,374	699	413,553	³ 10,022,612
New Orleans.....	1916	9	2,768	164,710	300,990	197,094	103,896	96	78,656	5,471,300
	1906	11	1,598	214,000	154,415	49,730	104,685	65	25,467	3,524,470
St. Louis.....	1916	5	2,103	201,440	55,604	17,657	37,947	32	19,421	372,970
	1906	⁴ 10	4,061	241,047	631,434	79,504	551,930	72	65,675	1,633,113
All other.....	1916	199	6,392	648,800	703,876	416,362	287,514	444	248,039	6,546,470
	1906	145	16,521	1,321,313	767,272	369,513	397,759	562	322,411	4,865,029
PER CENT OF TOTAL.										
Total.....	1916	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1906	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
New Orleans.....	1916	4.2	24.6	16.2	28.4	31.2	24.2	16.8	22.7	44.2
	1906	6.6	7.2	12.0	9.9	10.0	9.9	9.3	6.2	35.2
St. Louis.....	1916	2.3	18.7	19.8	5.2	2.8	8.8	5.6	5.6	3.0
	1906	6.0	18.3	13.6	40.7	15.9	52.3	10.3	15.9	16.3
All other.....	1916	93.4	56.8	63.9	66.4	66.0	67.0	77.6	71.7	52.8
	1906	87.3	74.5	74.4	49.4	74.1	37.7	80.4	78.0	48.5

¹ Includes 407,218 passengers carried on railway ferry steamers.² Includes 14 railway transfers of 8,127 tons which were treated in 1916 as freight and passenger vessels.³ Includes 350,282 passengers carried on railway ferry steamers.⁴ Includes 2 railway transfers of 1,223 tons which were treated in 1916 as freight and passenger vessels.

Municipal ferries.—Five counties in Tennessee own eight gasoline motor-propelled ferries of 133 gross tonnage with a value of \$11,900. They transferred across the river at various points 97,310 passengers in 1916. They are operated by the counties as free municipal or quasi-municipal ferries, no charge for the service being made. These ferries take the place of bridges, as it was found that it was much cheaper to own and operate free ferries than it was to build and maintain bridges.

YACHTS.

The yachts of the Mississippi River and its tributaries, of the tonnage included in the census, are all power boats. Tables 34 and 35 give the number, tonnage, and value of the yachts in service during the years 1906 and 1916, the former table showing the distribution according to character of power and the latter the distribution according to means of propulsion.

TABLE 34.—YACHTS—NUMBER, GROSS TONNAGE, AND VALUE, BY CHARACTER OF POWER AND RIVER SYSTEMS: 1916 AND 1906.

RIVER SYSTEM.	Census year.	TOTAL.			STEAM.			MOTOR.		
		Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.
Total.....	1916 1906	325 222	6,429 3,255	\$1,206,153 563,400	12 34	1,941 1,425	\$369,500 278,275	313 188	4,488 1,830	\$836,653 285,125
Ohio.....	1916 1906	90 56	1,205 644	178,428 136,700	3 9	206 152	53,000 69,050	87 47	999 492	125,428 67,650
Upper Mississippi.....	1916 1906	78 130	2,446 1,946	405,975 296,100	5 18	1,520 1,050	235,000 156,575	73 112	926 896	170,975 139,525
Lower Mississippi.....	1916 1906	157 36	2,778 665	621,750 130,600	4 7	215 223	81,500 52,650	153 29	2,563 442	540,250 77,950
PER CENT OF TOTAL.										
Total.....	1916 1906	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0
Ohio.....	1916 1906	27.7 25.2	18.7 19.8	14.8 24.3	25.0 26.5	10.6 10.7	14.3 24.8	27.8 25.0	22.3 26.9	15.0 23.7
Upper Mississippi.....	1916 1906	24.0 58.6	38.1 59.8	33.7 52.6	41.7 52.9	78.3 73.7	63.6 56.3	23.3 59.6	20.6 49.0	20.4 48.9
Lower Mississippi.....	1916 1906	48.3 16.2	43.2 20.4	51.5 23.2	33.3 20.6	11.1 15.6	22.1 18.9	48.9 15.4	57.1 24.2	64.6 27.3

TABLE 35.—YACHTS—NUMBER, GROSS TONNAGE, AND VALUE, BY CHARACTER OF PROPULSION AND RIVER SYSTEMS: 1916 AND 1906.

RIVER SYSTEM.	Census year.	TOTAL.			STERN WHEEL.			SIDE WHEEL.			SCREW.		
		Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.
Total.....	1916 1906	325 222	6,429 3,255	\$1,206,153 563,400	52 79	1,383 1,774	\$138,858 240,400	6 6	62 96	\$2,600 10,550	267 146	4,984 1,385	\$1,064,695 312,450
Ohio.....	1916 1906	90 56	1,205 644	178,428 136,700	27 24	390 254	33,358 26,650	4 1	42 12	2,300 1,000	59 31	773 378	142,770 109,050
Upper Mississippi.....	1916 1906	78 130	2,446 1,946	405,975 296,100	10 32	786 1,091	91,700 149,400	1 3	7 65	150 8,800	67 95	1,653 790	314,125 137,900
Lower Mississippi.....	1916 1906	157 36	2,778 665	621,750 130,600	15 14	207 429	13,800 64,350	1 2	13 19	150 750	141 20	2,558 217	607,800 65,500

Motor boats constituted 96.3 per cent of the total number of yachts propelled by machinery and 69.8 per cent of the tonnage in 1916, as compared with 84.7 per cent and 56.2 per cent, respectively, in 1906. At both census periods the value of the motor boats was a little over one-half of the value of all pleasure craft. Screw-propelled boats formed 82.2 per cent of the number of these motor boats, 77.5 per cent of the tonnage, and 88.3 per cent of the value in 1916, as against 65.8 per cent, 42.5 per cent, and 55.5 per cent, respectively, in 1906.

WORK BOATS.

A large number of work boats other than freight carriers are included among the unriggered craft. They comprise dredges, sand-pump boats, derrick barges, pile drivers, and other work craft not equipped with propelling power. The statistics pertaining to boats of this character, so far as they can be segregated, are shown for 1916 and 1906 in Tables 36 and 37. In some cases dredges, derrick barges, and like boats have been reported in connection with freight-carrying barges, and in such cases, when possible, the details for the

work boats have been segregated by apportionment. | diving, and pile-driving barges, and Table 37 shows
Table 36 shows the statistics for derricks, elevator, | the statistics for dredges and sand-pump boats.

TABLE 36.—WORK BOATS—DERRICKS, ELEVATOR, DIVING, AND PILE-DRIVING BOATS, BY RIVER SYSTEMS: 1916 AND 1906.

RIVER SYSTEM.	Census year.	Number.	Gross Tonnage.	Value.	Gross income.	Number employed on vessels.	Wages.
Total.....	1916	153	17,818	\$816,672	\$478,992	481	\$324,269
	1906	43	3,915	161,650	172,212	169	75,436
Per cent of increase.....		255.8	355.1	396.0	178.1	184.6	329.9
Ohio.....	1916	95	12,049	382,705	257,403	235	178,540
	1906	15	1,140	50,400	40,820	47	23,251
Per cent of increase.....		533.3	956.9	659.3	530.6	400.0	667.9
Upper Mississippi.....	1916	13	922	44,100	28,918	53	13,513
	1906	11	462	22,050	37,805	30	12,553
Per cent of increase ¹		18.2	99.6	100.0	-23.5	76.7	7.6
Lower Mississippi.....	1916	45	4,847	389,867	192,671	193	132,216
	1906	17	2,313	92,200	93,587	92	39,632
Per cent of increase.....		164.7	109.6	322.8	105.9	109.8	233.6

A minus sign (—) denotes decrease.

TABLE 37.—WORK BOATS—DREDGES AND SAND-PUMP BOATS, BY RIVER SYSTEMS: 1916 AND 1906.

RIVER SYSTEM.	Census year.	Number.	Gross tonnage.	Value.	Gross income.	Number employed on vessels.	Wages.
Total.....	1916	226	28,388	\$2,173,412	\$4,007,730	1,836	\$1,222,135
	1906	87	9,239	752,918	742,218	484	295,511
Per cent of increase.....		159.8	207.3	188.7	440.0	279.3	313.6
Ohio.....	1916	120	15,953	1,104,662	2,349,249	1,067	710,745
	1906	40	4,527	382,768	322,413	168	123,890
Per cent of increase.....		200.0	252.4	188.6	628.6	535.1	473.7
Upper Mississippi.....	1916	64	5,353	543,422	953,427	466	285,710
	1906	32	2,688	226,850	281,920	222	122,171
Per cent of increase.....		100.0	99.1	139.6	238.2	109.9	133.9
Lower Mississippi.....	1916	42	7,082	525,328	705,054	303	225,680
	1906	15	2,024	143,300	137,885	94	49,450
Per cent of increase.....		180.0	249.9	266.6	411.3	222.3	356.4

RAILWAY SHIPPING.

Freight and passenger cars were ferried at 16 points on the Mississippi River and its tributaries in 1916 and at 14 points in 1906. The transfer points in 1916 were as follows:

On the Ohio River: Between Ashland, Ky., and Coal Grove, Ohio; Ashland, Ky., and Ironton, Ohio; Paducah, Ky., and Brockport, Ill.; and Sleeth, Ky., and Metropolis, Ill.

On the Tennessee River: Between Gunter's Landing and Hobbs

Island, Ala., and the Chamberlain and Caney Creek Inclines of the Roane Iron Co., Tenn.

On the Mississippi River: Near St. Louis, between West Ivory, Mo., and East Ivory, Ill.; between Little Rock, Mo., and Kellogg's Landing, Ill.; Cairo, Ill., and Birds Point, Mo.; Helena, Ark., and Trotters Point, Miss.; Vicksburg, Miss., and Delta, La.; Natchez, Miss., and Vidalia, La.; Naples and Angola, La.; Baton Rouge and Anchorage, La.; New Orleans and Algiers and New Orleans and Goulsboro, La.

The general statistics for 1906 and 1916 are presented in Table 38.

TABLE 38.—CRAFT OPERATED IN CONNECTION WITH STEAM RAILROADS, BY CLASS: 1916 AND 1906.

	TOTAL.		STEAM.		UNRIGGED.		PER CENT OF INCREASE. ¹		
	1916 ²	1906	1916	1906	1916	1906	Total.	Steam.	Unrigged.
Number of vessels.....	38	38	25	24	13	14	.....	4.2	-7.1
Gross tonnage.....	20,145	21,206	11,107	10,480	9,038	10,726	-5.0	6.0	-15.7
Value of vessels.....	\$1,655,740	\$1,231,895	\$1,387,795	\$1,009,154	\$267,945	\$222,741	34.4	37.5	20.3
Number employed on vessels.....	320	261	290	255	21	6	22.6	17.3	250.0
Wages.....	\$241,761	\$192,201	\$225,758	\$188,601	\$16,003	\$3,600	25.8	19.7	\$44.5
Number of passengers carried.....	790,843	837,514	766,448	371,514	24,395	.....	112.9	106.3	.....

¹ A minus sign (—) denotes decrease.

² Exclusive of 4 ferryboats of 508 gross tons in public service carrying 1,040,312 passengers.

³ Includes 21,232 passengers carried on towboats.

Passengers were reported as carried at the following car-transfer points:

On the Mississippi, at New Orleans, between Baton Rouge and Anchorage, Naples and Angola, Natchez and Vidalia, Vicksburg and Delta, Helena and Trotters Point, Cairo and Birds Point, and Little Rock and Kellogg's Landing. On the Ohio between Metropolis and Sleeth, and on the Tennessee between Chamberlain and Caney Inclines and Gunter's Landing and Hobbs Island.

Table 39 presents, by river systems, for 1916 and 1906, the details of the vessel equipment for this service and the freight handled in both years.

This table shows that 63.2 per cent of the vessels, 71.2 per cent of the tonnage used in connection with steam railroads, and 83.8 per cent of the freight was moved on the Lower Mississippi River system.

TABLE 39.—CRAFT OPERATED IN CONNECTION WITH STEAM RAILROADS, BY RIVER SYSTEMS: 1916 AND 1906.

	Total.	Ohio system.	Lower Mississippi system.
Number of vessels: ¹			
1916.....	38	14	24
1906.....	38	9	29
Gross tonnage:			
1916.....	20,145	5,798	14,347
1906.....	21,206	2,887	18,319
Steam:			
Number—			
1916.....	25	7	18
1906.....	24	5	19
Gross tonnage—			
1916.....	11,107	1,268	9,839
1906.....	10,480	1,427	9,053
Freight and passenger—			
Number—			
1916.....	8	1	7
1906.....			
Gross tonnage—			
1916.....	6,556	575	5,981
1906.....			
Ferryboats—			
Number—			
1916.....	2		2
1906.....	13	2	11
Gross tonnage—			
1916.....	2,144		2,144
1906.....	8,653	974	7,679
Towboats—			
Number—			
1916.....	15	6	9
1906.....	11	3	8
Gross tonnage—			
1916.....	2,407	693	1,714
1906.....	1,827	453	1,374
Unrigged:			
Number—			
1916.....	13	7	6
1906.....	14	4	10
Gross tonnage—			
1916.....	9,038	4,530	4,508
1906.....	10,726	1,460	9,266
Freight in cars (tons):			
1916.....	12,332,713	1,996,223	10,336,490
1906.....	6,905,597	287,777	6,617,820

¹ Exclusive of 4 public ferries.

GOVERNMENT VESSELS.

State and city—The general statistics for the vessels owned and operated by state and city governments in 1916 and 1906 are given in Table 40.

TABLE 40.—VESSELS OWNED AND OPERATED BY STATE AND CITY GOVERNMENTS: 1916 AND 1906.

	Total.	Steam.	Unrigged.
Number of vessels:			
1916.....	12	7	5
1906.....	8	4	4
Gross tonnage:			
1916.....	1,729	1,022	707
1906.....	873	375	498
Value of vessels:			
1916.....	\$389,108	\$176,608	\$212,500
1906.....	\$80,200	\$59,700	\$20,500
Gross income:			
1916.....	\$98,896	\$12,688	\$86,208
1906.....	\$7,000	\$1,000	\$6,000
Number employed on vessels:			
1916.....	134	52	82
1906.....	15	15	
Wages:			
1916.....	\$93,389	\$41,407	\$51,982
1906.....	\$11,300	\$11,300	
Number of passengers carried:			
1916.....			
1906.....	5,000	5,000	

These vessels were employed as follows:

Service in Louisiana: One gasoline boat, used by the Department of Conservation for conservation patrol duty; three unrigged craft, a derrick boat, dredge boat, and harbor boat, used by the Board of Commissioners of the Port of New Orleans in harbor work; and two tugs used by the Board of Control of New Basin Canal and Shell Road in canal towing within the city of New Orleans.

Service at St. Louis: One launch and one steamer used by the city of St. Louis for harbor inspection work and for levee watching and fighting harbor fires.

Service in Illinois: One steamer used by the state as a naval training ship.

Service in Kansas: One dredge used in Kansas Valley Drainage District of Wyandotte County for drainage work.

Federal—The United States Government has a large number of vessels in service on the Mississippi River and its tributaries, comprising steamboats, tenders, launches, towboats, snag boats, dredges of different types, derrick boats, repair boats, barges, scows, and flats. They are used chiefly in connection with the various improvements to the channels and harbors. They are under the direction of the Chief of Engineers of the War Department. No census was taken of these boats in 1916, and they are not included in this report.

FISHING CRAFT.

The statistics of vessels engaged in the commercial fisheries in 1916 are given in Table 41.

TABLE 41.—FISHING VESSELS: 1916.

	Total.
Number of vessels.....	8
Gross tonnage.....	92
Value of vessels.....	\$14,400
Gross income.....	\$26,110
Number employed on vessels.....	26
Wages.....	\$16,227

IDLE VESSELS.

Table 42 gives the statistics in regard to idle vessels for 1916 and 1906, which are not included in the foregoing tables.

TABLE 42.—IDLE VESSELS: 1916 AND 1906.

	TOTAL.		STEAM, ¹		UNRIGGED.	
	1916	1906	1916	1906	1916	1906
Number of vessels.....	291	171	161	100	130	71
Gross tonnage.....	33,510	15,038	9,741	4,482	23,769	10,556
Net tonnage.....	32,409	14,564	8,669	4,009	23,740	10,556
Value of vessels.....	\$874,263	\$310,635	\$622,910	\$256,220	\$251,353	\$54,465
Construction:						
Wood.....	277	166	148	95	129	71
Metal.....	13	4	12	4	1	
Composite.....	1	1	1	1		
Character of propulsion:						
Stern wheel.....	94	58	94	58		
Side wheel.....	9	5	9	5		
Screw.....	58	36	58	36		
All others.....		1		1		

¹ Includes craft propelled by machinery.

In 1916 idle steam vessels constituted 8.7 per cent of all steam vessels, active and idle, 7.5 per cent of the tonnage, and 4.5 per cent of the value; in the same year the idle unrigged craft, formed 2.3 per cent of the number of all unrigged craft, 1.6 per cent of the tonnage, and 2.5 per cent of the value.

In 1906 the idle steam vessels, or steam vessels for which no traffic report was received, were 100 in number; they had a tonnage of 4,482 and were valued at \$256,220. The proportion these vessels formed of all steam vessels amounted to 6.9 per cent for number, 3 per cent for tonnage, and 1.9 per cent for value.

Table 43 gives detailed statistics for water transportation on the Mississippi and its tributaries for 1916.

TABLE 43.—ALL VESSELS, BY CLASS,

	CLASS, OCCUPATION, AND OWNERSHIP.	Number of vessels.	TONNAGE.		RIGGED.				HORSEPOWER OF ENGINES.		
			Gross.	Net.	Screw.	Side wheel.	Stern wheel.	All other.	Steam.	Gasoline.	All other.
1	Total.....	7,247	1,621,587	1,583,186	611	79	1,017	1	189,326	30,293	.....
2	STEAM AND MOTOR.....	1,708	120,055	105,183	611	79	1,017	1	189,326	30,293	.....
3	Freight and passenger.....	389	48,602	44,456	128	39	222	.....	61,507	6,783	.....
4	Tugs and other towing vessels.....	736	49,865	42,338	159	10	567	.....	106,212	9,469	.....
5	Ferryboats.....	213	11,263	9,951	44	22	146	1	12,142	2,543	.....
6	Fishing.....	8	92	63	6	.....	2	.....	12	173	.....
7	Yachts.....	325	6,429	4,906	267	6	52	.....	3,566	10,949	.....
8	Miscellaneous.....	37	3,804	3,469	7	2	28	.....	5,887	376	.....
9	STEAM.....	636	103,115	91,023	105	51	479	1	189,326	.....	.....
10	Freight and passenger.....	162	43,162	39,759	13	33	116	.....	61,507	.....	.....
11	Tugs and other towing vessels.....	362	45,339	38,576	80	5	277	.....	106,212	.....	.....
12	Ferryboats.....	71	9,155	8,087	5	11	54	1	12,142	.....	.....
13	Fishing.....	1	10	7	1	.....	.....	.....	12	.....	.....
14	Yachts.....	12	1,941	1,392	6	.....	6	.....	3,566	.....	.....
15	Miscellaneous.....	28	3,508	3,202	.....	2	26	.....	5,887	.....	.....
16	Individual.....	151	13,332	11,440	28	8	115	.....	25,877	.....	.....
17	Freight and passenger.....	40	4,246	3,833	7	3	30	.....	5,999	.....	.....
18	Tugs and other towing vessels.....	73	5,822	4,860	14	1	58	.....	13,835	.....	.....
19	Ferryboats.....	23	1,036	1,017	2	4	17	.....	1,785	.....	.....
20	Fishing.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
21	Yachts.....	11	1,784	1,286	5	.....	6	.....	3,091	.....	.....
22	Miscellaneous.....	4	444	444	.....	.....	4	.....	1,167	.....	.....
23	Firm.....	72	6,486	5,141	13	5	54	.....	11,455	.....	.....
24	Freight and passenger.....	19	2,908	2,306	2	3	14	.....	5,043	.....	.....
25	Tugs and other towing vessels.....	35	2,482	1,931	7	1	27	.....	4,595	.....	.....
26	Ferryboats.....	9	354	332	2	1	6	.....	535	.....	.....
27	Fishing.....	1	10	7	1	.....	.....	.....	12	.....	.....
28	Yachts.....	1	157	106	1	.....	.....	.....	475	.....	.....
29	Miscellaneous.....	7	575	459	.....	.....	7	.....	795	.....	.....
30	Incorporated company.....	408	82,372	73,636	61	37	309	1	150,352	.....	.....
31	Freight and passenger.....	103	36,008	33,620	4	27	72	.....	50,465	.....	.....
32	Tugs and other towing vessels.....	251	36,819	31,688	56	3	192	.....	86,980	.....	.....
33	Ferryboats.....	39	7,765	6,738	1	6	31	1	9,822	.....	.....
34	Yachts.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	Miscellaneous.....	15	1,780	1,590	.....	1	14	.....	3,085	.....	.....
36	All other.....	5	925	806	3	1	1	.....	1,642	.....	.....
37	Freight and passenger.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
38	Tugs and other towing vessels.....	3	216	97	3	.....	.....	.....	802	.....	.....
39	Ferryboats.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	Fishing.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
41	Yachts.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
42	Miscellaneous.....	2	709	709	.....	1	1	.....	840	.....	.....
43	MOTOR.....	1,072	16,940	14,160	506	28	533	.....	.....	30,293	.....
44	Freight and passenger.....	227	5,440	4,697	115	6	106	.....	6,783	.....	.....
45	Tugs and other towing vessels.....	374	4,526	3,762	79	5	290	.....	9,469	.....	.....
46	Ferryboats.....	142	2,108	1,864	39	11	92	.....	2,543	.....	.....
47	Fishing.....	7	82	56	5	.....	2	.....	173	.....	.....
48	Yachts.....	313	4,488	3,514	261	6	46	.....	10,949	.....	.....
49	Miscellaneous.....	9	296	267	7	.....	2	.....	376	.....	.....
50	Individual.....	716	9,684	7,892	376	22	318	.....	19,333	.....	.....
51	Freight and passenger.....	158	2,466	1,979	80	5	73	.....	4,201	.....	.....
52	Tugs and other towing vessels.....	208	2,356	1,959	44	3	161	.....	4,575	.....	.....
53	Ferryboats.....	86	1,228	1,110	30	8	43	.....	1,391	.....	.....
54	Fishing.....	6	64	44	4	.....	2	.....	133	.....	.....
55	Yachts.....	256	3,550	2,781	218	6	32	.....	8,993	.....	.....
56	Miscellaneous.....	2	20	19	.....	.....	2	.....	40	.....	.....
57	Firm.....	175	2,370	2,028	66	3	106	.....	4,525	.....	.....
58	Freight and passenger.....	40	643	548	15	.....	25	.....	1,014	.....	.....
59	Tugs and other towing vessels.....	64	772	665	11	.....	53	.....	1,587	.....	.....
60	Ferryboats.....	26	430	391	4	3	19	.....	564	.....	.....
61	Fishing.....	1	18	12	1	.....	.....	.....	40	.....	.....
62	Yachts.....	43	498	405	34	.....	9	.....	1,296	.....	.....
63	Miscellaneous.....	1	9	7	1	.....	.....	.....	24	.....	.....
64	Incorporated company.....	165	4,577	3,986	57	3	105	.....	5,987	.....	.....
65	Freight and passenger.....	27	2,309	2,149	19	1	7	.....	1,563	.....	.....
66	Tugs and other towing vessels.....	101	1,368	1,118	23	2	76	.....	3,182	.....	.....
67	Ferryboats.....	22	317	261	5	.....	17	.....	499	.....	.....
68	Yachts.....	10	401	295	5	.....	5	.....	591	.....	.....
69	Miscellaneous.....	5	182	163	5	.....	.....	.....	212	.....	.....
70	All other.....	16	309	254	7	.....	9	.....	448	.....	.....
71	Freight and passenger.....	2	22	21	1	.....	1	.....	65	.....	.....
72	Tugs and other towing vessels.....	1	30	20	1	.....	.....	.....	125	.....	.....
73	Ferryboats.....	8	133	102	.....	.....	8	.....	89	.....	.....
74	Fishing.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
75	Yachts.....	4	39	33	4	.....	.....	.....	69	.....	.....
76	Miscellaneous.....	1	85	78	1	.....	.....	.....	100	.....	.....
77	UNRIGGED.....	5,539	1,501,532	1,478,003	.....	.....	.....	.....	.....	.....	.....
78	Individual.....	991	159,132	158,573	.....	.....	.....	.....	.....	.....	.....
79	Firm.....	371	37,590	37,128	.....	.....	.....	.....	.....	.....	.....
80	Incorporated company.....	4,158	1,303,966	1,281,504	.....	.....	.....	.....	.....	.....	.....
81	All other.....	19	844	798	.....	.....	.....	.....	.....	.....	.....

¹ Does not include 12,206,844 tons of freight lightered.

OCCUPATION, AND OWNERSHIP: 1916.

CONSTRUCTION.			Value of vessels.	INCOME.			Number employed on vessels.	Wages.	Number of passengers carried.	Freight carried (tons of 2,000 pounds).	
Metal.	Wood.	Composite.		Freight.	Passengers.	All other.					
411	6,804	32	\$23,044,903	\$5,671,446	\$2,404,703	\$9,389,707	14,732	\$6,396,552	17,699,378	1 27,962,583	1
132	1,562	14	13,157,454	3,488,625	2,319,071	5,721,086	12,535	5,107,908	16,596,431	7,992,998	2
30	358	1	4,531,749	3,459,646	1,643,781	209,074	4,091	2,123,755	4,084,851	7,982,683	3
60	668	8	5,917,111	28,979	43,772	3,938,893	7,361	2,301,009	119,870	10,315	4
18	192	3	1,014,950		631,113	429,357	572	346,116	12,390,740		5
	8		14,400			26,110	26	16,227			6
20	304	1	1,206,153		405	10,653	173	98,399	970		7
4	32	1	473,091			1,106,999	312	222,402			8
84	543	9	10,870,444	3,128,125	2,025,548	4,987,983	10,967	4,475,922	14,513,147	7,752,419	9
16	145	1	3,864,783	3,104,037	1,466,502	166,448	3,565	1,916,493	3,279,819	7,746,169	10
51	305	6	5,377,020	24,088	33,995	3,402,344	6,646	2,042,137	77,328	6,250	11
11	59	1	815,650		525,051	328,712	394	272,241	11,156,000		12
	1		1,500			2,050	1	200			13
3	9		369,500			3,500	74	34,399			14
3	24	1	441,991			1,084,929	287	210,452			15
12	136	3	1,562,137	433,398	223,602	927,870	1,284	645,957	1,572,038	288,680	16
3	37		363,800	431,008	121,411	17,234	558	234,752	411,118	287,880	17
5	66	2	701,330	2,390	5,625	472,402	511	282,163	43,400	800	18
1	21	1	111,600		96,566	55,899	77	41,947	1,117,520		19
2	9		299,500			3,500	64	31,899			20
1	3		85,907			378,835	74	55,196			21
4	67	1	752,757	169,964	176,573	243,813	583	289,905	1,046,454	105,802	22
1	18		332,700	166,264	144,994	9,812	275	122,187	359,207	101,402	23
2	32	1	230,107	3,700		128,189	225	103,619		4,400	24
	9		35,200		31,579	32,941	33	21,981	687,247		25
	1		1,500			2,050	1	200			26
1	7		70,000			70,821	10	2,500			27
			83,250				39	19,418			28
66	337	5	8,391,942	2,524,763	1,625,373	3,803,612	9,054	3,524,626	11,894,655	7,357,937	29
12	90	1	3,168,283	2,508,785	1,200,697	139,402	2,732	1,559,554	2,509,494	7,356,887	30
43	205	3	4,353,975	17,998		2,789,065	5,892	1,640,465	33,928	1,050	31
10	29		668,850		396,906	239,872	284	208,313	9,351,233		32
1	13	1	200,834			635,273	146	116,294			33
2	3		163,608			12,688	46	35,434			34
1	2		91,608			12,688	18	15,890			35
											36
											37
											38
											39
											40
1	1		72,000				28	19,544			41
48	1,019	5	2,287,010	360,500	293,523	733,103	1,568	631,986	2,083,284	240,579	42
14	213		666,966	355,609	177,279	42,628	526	207,262	805,032	236,514	43
9	363	2	540,091	4,891	9,777	536,549	715	258,872	42,542	4,065	44
7	133	2	199,300		106,062	100,645	178	73,875	1,234,740		45
	7		12,900			24,060	25	16,027			46
17	295	1	836,653		405	7,153	99	64,000	970		47
1	8		31,100			22,070	25	11,950			48
29	682	5	1,380,328	184,029	176,586	408,200	842	337,683	1,189,540	127,327	49
8	150		287,670	183,367	106,219	31,978	285	111,786	448,363	126,923	50
3	203	2	243,275	662	9,148	290,683	351	112,116	41,358	404	51
5	79	2	115,500		60,974	57,081	98	39,247	699,249		52
	6		9,900			20,560	22	14,947			53
13	242	1	723,383		245	7,148	84	59,537	570		54
	2		600			750	2	50			55
9	166		269,970	53,931	47,685	119,474	254	81,639	314,120	62,310	56
2	38		76,700	51,223	29,819	6,991	91	27,065	133,172	59,614	57
4	60		79,450	2,708	629	72,961	114	36,962	1,184	2,696	58
	26		43,400		17,237	35,222	41	15,051	179,764		59
	1		3,000			3,500	3	1,080			60
3	40		65,920				3	1,171			61
	1		1,500			800	2	310			62
8	157		587,162	121,540	65,752	204,740	452	196,685	475,314	50,442	63
4	23		297,596	120,019	37,741	2,968	145	65,298	216,497	49,477	64
1	100		200,366	1,521		172,905	247	106,914		965	65
2	20		28,500		27,851	8,342	31	14,151	258,417		66
	10		41,700		160	5	12	3,292	400		67
1	4		19,000			20,520	17	7,030			68
2	14		49,550	1,000	3,500	689	20	15,979	104,310	500	69
	2		5,000	1,000	3,500	689	5	3,113	7,000	500	70
1			17,000				3	2,880			71
	8		11,900				8	5,426	97,310		72
1	3		5,650								73
	1		10,000				4	4,500			74
											75
											76
279	5,242	18	9,887,449	2,182,821	85,632	3,668,621	2,197	1,288,644	1,002,947	1 19,969,585	77
10	971	10	1,407,449	453,355	42,341	485,570	405	195,633	474,725	1,076,884	78
9	357	5	535,865	97,795	4,386	383,697	271	143,769	74,464	254,974	79
260	3,895	3	7,725,815	1,631,671	25,270	2,711,142	1,447	907,905	340,158	18,637,727	80
	19		218,290		13,635	88,212	74	41,340	113,600		81

CANALS AND OTHER INLAND WATERS

CANALS AND OTHER INLAND WATERS.

By JOHN G. HAWES and ELMORE W. SANDERSON.

SCOPE OF THE REPORT.

The statistics in this section relate to transportation by all vessels, documented and undocumented, of 5 tons net register or over, operating on all canals, exclusive of ship canals, except that the Chicago Drainage and Ship Canal is included; on all lakes, except the Great Lakes; on all rivers, canalized or other, tributary to the Great Lakes, but not on any river tributary to the Mississippi; on the Red River (of the North); and on all rivers, above tidewater, tributary to the Atlantic and Pacific Oceans and the Gulf of Mexico.

GENERAL SUMMARY.

When it is possible, comparable statistics are shown for 1906 and 1916, but only in a few tables can 1889 be given, statistics for that year having been reported generally on a different basis and tabulated in various geographic divisions. Statistics for fishing vessels are not included in any comparative tables, as such data were not collected for 1906.

Table 1 shows comparable data for 1916 and 1906 for the United States as a whole, for New York state separately, and for all other states combined.

TABLE 1.—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS: 1916 AND 1906.

	Cen- sus year.	AGGREGATE. ¹			STEAM. ²			SAIL.			UNRIGGED.		
		Total.	Canals and other inland waters of New York state.	All other inland waters.	Total.	Canals and other inland waters of New York state.	All other inland waters.	Total.	Canals and other inland waters of New York state.	All other inland waters.	Total.	Canals and other inland waters of New York state.	All other inland waters.
Number of vessels.....	1916	2,049	978	1,071	574	170	404	5	4	1	1,470	804	666
	1906	2,140	1,048	492	337	151	186	14	13	* 1	1,789	1,484	305
Gross tonnage.....	1916	196,426	115,290	81,136	27,856	11,603	16,253	258	150	108	168,312	103,537	64,775
	1906	259,491	209,152	50,339	21,507	14,127	7,380	518	495	23	237,466	194,530	42,936
Value of vessels.....	1916	\$5,744,486	\$2,857,239	\$2,887,247	\$3,357,686	\$1,291,796	\$2,065,890	\$8,650	\$7,150	\$1,500	\$2,378,150	\$1,558,293	\$819,857
	1906	\$4,586,791	\$3,294,221	\$1,292,570	\$2,225,673	\$1,390,512	\$835,161	\$16,800	\$16,000	\$800	\$2,344,318	\$1,887,709	\$456,609
Gross income.....	1916	\$4,179,481	\$2,138,557	\$2,040,924	\$1,553,498	\$500,634	\$1,052,864	\$1,150	\$550	\$600	\$2,624,833	\$1,637,373	\$987,460
	1906	\$3,957,729	\$2,781,604	\$1,176,125	\$1,065,469	\$525,970	\$539,499	\$4,250	\$4,250	.....	\$2,888,010	\$2,251,384	\$636,626
Number employed on vessels.....	1916	3,168	1,490	1,678	1,511	533	978	5	3	2	1,652	954	698
	1906	3,731	2,472	1,259	1,153	590	563	11	11	.....	2,567	1,871	696
Wages.....	1916	\$1,263,885	\$590,788	\$673,097	\$588,590	\$195,163	\$393,427	\$1,280	\$1,100	\$180	\$674,015	\$394,525	\$279,490
	1906	\$1,361,030	\$920,260	\$440,770	\$412,134	\$192,238	\$219,896	\$1,620	\$1,620	.....	\$947,276	\$726,402	\$220,874
Number of passengers carried.....	1916	2,005,036	457,351	1,547,685	1,994,236	449,351	1,544,885	.....	.....	.....	10,800	8,000	2,800
	1906	1,877,889	835,052	1,042,837	1,871,769	828,932	1,042,837	.....	.....	.....	6,120	6,120	.....
Freight and harbor work (tons of 2,000 pounds).	1916	3,059,479	1,417,744	1,641,735	199,319	80,602	118,717	1,920	770	1,150	2,858,240	1,336,372	1,521,868
	1906	3,944,655	2,712,481	1,232,174	261,315	105,498	155,817	6,968	6,968	.....	3,676,372	2,600,015	1,076,357
Freight carried.....	1916	2,542,626	1,120,762	1,421,864	197,069	78,352	118,717	1,920	770	1,150	2,343,637	1,041,640	1,301,997
	1906	3,716,765	2,502,891	1,213,874	259,815	103,998	155,817	6,968	6,968	.....	3,449,982	2,391,925	1,058,057
Harbor work.....	1916	516,853	296,982	219,871	2,250	2,250	.....	.....	.....	.....	514,603	294,732	219,871
	1906	227,890	209,590	18,300	1,500	1,500	.....	.....	.....	.....	226,390	208,096	18,300

¹ Exclusive of 134 vessels with a gross tonnage of 9,829 reported as idle in 1916; and 68 vessels with a gross tonnage of 7,368 reported as idle in 1906.

² Includes craft propelled by machinery.

* A pleasure yacht.

The figures given in Table 1 show a decrease for the decade in many of the items. There was a noticeable increase, however, in value of vessels, 25.2 per cent, notwithstanding a decrease in tonnage of 24.3 per cent. The increases are for the most part limited to inland waters in states other than New York. The fact should not be lost sight of, however, that although the figures for New York show very decided decreases, the state reported about one-half of each of the items in the table in 1916, with the exception of number of passengers carried.

Table 2 shows the number, gross tonnage, and value of vessels, by classes, for the years 1916, 1906, and 1889.

The increase in number of steam vessels (252.1 per cent) from 1889 to 1916 and the decrease in each of the other classes represent the growing tendency of transportation on inland waterways. The unriggered boats decreased 77 per cent in number during that period, although they still outnumbered the steam vessels. The steam vessels showed a greater value than the unriggered boats in 1916, but the tonnage of the unriggered craft far exceeded that of the steam craft. In 1916 a total of 112 steam vessels, with a gross tonnage of 5,741, was operated on canals.

The great decrease in unriggered craft from 1889 to 1906 is explained by the abandonment during the 17-year period of a large number of boats as old and

unseaworthy, while the addition of new boats was insignificant.

TABLE 2.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CLASS: 1916, 1906, AND 1889.

	1916	1906	1889	PER CENT OF INCREASE. ¹	
				1906-1916	1889-1916
Total:					
Number of vessels.....	2,049	2,140	6,575	-4.3	-68.8
Gross tonnage.....	196,426	259,491	996,629	-24.3	-80.3
Value.....	\$5,744,486	\$4,586,791	\$8,138,914	25.2	-6.4
Steam: ²					
Number of vessels.....	574	337	163	70.3	252.1
Gross tonnage.....	27,856	21,507	19,223	29.5	44.9
Value.....	\$3,357,686	\$2,225,673	\$790,000	50.9	325.0
Sail:					
Number of vessels.....	5	14	25	-80.0	-80.0
Gross tonnage.....	258	518	1,925	-50.2	-86.6
Value.....	\$8,650	\$16,800	\$36,800	-48.5	-76.5
Unrigged:					
Number of vessels.....	1,470	1,789	6,387	-17.8	-77.0
Gross tonnage.....	168,312	237,466	975,481	-29.1	-82.7
Value.....	\$2,378,150	\$2,344,318	\$5,312,114	1.4	-55.2

¹ A minus sign (-) denotes decrease. Percentages are omitted when base is less than 100.

² Includes craft propelled by machinery.

The decrease in number of unrigged boats from 1906 to 1916 is due largely to the decrease of canal boats operating on the canals of New York state. The Superintendent of Public Works of the state of New York in his report on canals for the year 1916 (p. 8) states that—

The falling off in the total canal tonnage during 1916 was not unexpected. In my report submitted in January last I referred to several causes which would inevitably lead to lessened shipments. Among these were the decreasing number of seaworthy boats suitable for canal traffic and the hesitancy on the part of boat-building concerns to construct craft of a type suitable to the new conditions until the improved channel was ready for use. While the reasons then given apply with equal force to the tonnage figures of the season just past, a further explanation of the smaller tonnage figures is offered in the fact that approximately 200 boats heretofore used for the carrying of canal freight were withdrawn from that service and made use of during the past season for storage purposes in New York Harbor. A serious congestion of freight existed there, and craft of every type suitable for such purpose were eagerly sought. At various times during the past summer the assistance of the department was sought in securing boats for the transportation of freight, and freight was offered for shipments beyond the capacity

of the canal vessels in use. From reports received covering the situation, there is every reason to believe that had the canal boats withdrawn for storage use been continued in the canal service, even with no new craft added, the tonnage for 1916 would have shown a considerable increase over the preceding year instead of an actual decrease.

Table 3 shows the percentage that the several items in the table form of the total for each of the three classes of vessels for 1916 and 1906.

TABLE 3.—PER CENT THAT STEAM, SAIL, AND UNRIGGED VESSELS FORM OF TOTAL: 1916 AND 1906.

	STEAM. ¹		SAIL.		UNRIGGED:	
	1916	1906	1916	1906	1916	1906
Number of vessels.....	28.0	15.7	0.2	0.7	71.7	83.6
Gross tonnage.....	14.2	8.3	0.1	0.2	85.7	91.5
Value of vessels.....	58.4	48.5	0.2	0.4	41.4	51.1
Gross income.....	37.2	26.9	(?)	0.1	62.8	73.0
Number employed on vessels.....	47.7	30.9	0.2	0.3	52.1	68.8
Wages.....	46.6	30.3	0.1	0.1	53.3	69.6
Number of passengers carried.....	99.5	99.7	.....	.....	0.5	0.3
Freight carried, including harbor work (tons of 2,000 pounds).....	6.5	6.6	0.1	0.2	93.4	93.2

¹ Includes craft propelled by machinery.

² Less than one-tenth of 1 per cent.

In 1916, 71.7 per cent of the total number of vessels operating on all inland waters were unrigged craft, mostly canal boats. They represented 85.7 per cent of the gross tonnage of all vessels, but only 41.4 per cent of the value, as compared with percentages of 83.6, 91.5, and 51.1, respectively, in 1906. In 1916 nearly two-thirds of the gross income and slightly more than one-half of the number of employees and their wages were reported by the unrigged craft. The steam vessels reported practically all of the passengers carried, only five-tenths of 1 per cent being reported for the unrigged craft and none for sail vessels. On the other hand, almost all of the freight was carried by the unrigged craft, the sailing vessels reporting only one-tenth of 1 per cent of the total and the steam vessels but 6.5 per cent.

Table 4 shows the proportions reported by New York state and by all other states of the total for the various items in Table 1, for steam, sail, and unrigged craft, for 1916 and 1906.

TABLE 4.—PER CENT THAT CANALS AND OTHER INLAND WATERS OF NEW YORK STATE AND OF ALL OTHER STATES FORM OF TOTAL, FOR ALL VESSELS AND FOR EACH CLASS: 1916 AND 1906.

	CANALS AND OTHER INLAND WATERS.															
	Aggregate.								Steam. ¹				Sail.			
	New York.				All other states.				New York.		All other states.				New York.	
	1916		1906		1916		1906		1916	1906	1916	1906	1916	1906	1916	1906
	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906	1916	1906
Number of vessels.....	47.7	77.0	52.3	23.0	29.6	44.8	70.4	55.2	80.0	92.9	20.0	7.1	54.7	83.0	45.3	17.0
Gross tonnage.....	58.7	80.6	41.3	19.4	41.7	65.7	58.3	34.3	58.1	95.6	41.9	4.4	61.5	81.9	38.5	18.1
Value of vessels.....	49.7	71.8	50.3	28.2	38.5	62.5	61.5	37.5	82.7	95.2	17.3	4.8	65.5	80.5	34.5	19.5
Gross income.....	51.2	70.3	48.8	29.7	32.2	49.4	67.8	50.6	47.8	100.0	52.2	.....	62.4	78.0	37.6	22.0
Number employed on vessels.....	47.0	66.3	53.0	33.7	35.3	51.2	64.7	48.8	60.0	100.0	40.0	.....	57.7	72.9	42.3	27.1
Wages.....	46.7	67.6	53.3	32.4	33.2	46.6	66.8	53.4	85.9	100.0	14.1	.....	58.5	76.7	41.5	23.3
Number of passengers carried.....	22.8	44.5	77.2	55.5	22.5	44.3	77.5	55.7	.....	.....	.....	.....	74.1	100.0	25.9	.....

¹ Includes craft propelled by machinery.

Of the total number of vessels of all kinds reported, 77 per cent were operated on the canals and other inland waters of New York state in 1906, but only 47.7 per cent in 1916. Similar decreases are shown for all other items in the table. Great changes are shown for unrigged craft in all other states, the relative proportions of the several items showing decided increases in 1916 over those for 1906. In a lesser degree the same conditions apply to steam and to sail vessels for all other states.

Idle vessels.—Table 5 shows the number and gross tonnage of steam, sail, and unrigged vessels that were idle in 1916 and 1906.

There was an increase in the number and tonnage of idle steam and unrigged vessels during the decade, steam craft showing both a greater actual and proportionate increase than the unrigged. Of the total

number of idle vessels in 1916, about two-thirds were outside the state of New York.

TABLE 5.—IDLE VESSELS, WITH PER CENT OF INCREASE: 1916 AND 1906.

CLASS.	NUMBER OF VESSELS.		GROSS TONNAGE.		
	1916	1906	1916	1906	Percent of increase.
Total.....	134	68	9,829	7,368	33.4
Steam ¹	78	18	2,678	651	311.4
Sail.....	1	1	10	10	.....
Unrigged.....	55	49	7,141	6,707	6.5

¹ Includes craft propelled by machinery.

Table 6 shows statistics for steam and motor vessels operating on canals and other inland waters of New York state and of all other states in 1916.

TABLE 6.—VESSELS PROPELLED BY MACHINERY OPERATING ON CANALS AND OTHER INLAND WATERS OF NEW YORK STATE AND OF ALL OTHER STATES: 1916.

	AGGREGATE.			NEW YORK.			ALL OTHER STATES.		
	Total.	Steam.	Motor.	Total.	Steam.	Motor.	Total.	Steam.	Motor.
Number of vessels.....	577	340	1 237	170	119	51	407	221	186
Gross tonnage.....	27,892	23,907	3,985	11,603	10,103	1,500	16,289	13,804	2,485
Horsepower.....	43,140	35,160	7,980	15,191	12,687	2,504	27,949	22,473	5,476
Value of vessels.....	\$3,361,286	\$2,752,683	\$608,603	\$1,291,796	\$1,040,286	\$251,510	\$2,069,490	\$1,712,397	\$357,093
Gross income.....	\$1,566,340	\$1,353,272	\$213,068	\$500,634	\$449,414	\$51,220	\$1,065,706	\$903,858	\$161,848
Freight.....	\$295,436	\$256,288	\$39,148	\$97,507	\$86,061	\$11,446	\$197,929	\$170,227	\$27,702
Passengers.....	\$627,211	\$533,238	\$93,973	\$144,709	\$134,827	\$9,882	\$482,502	\$398,411	\$84,091
All other sources.....	\$643,693	\$563,746	\$79,947	\$258,418	\$228,526	\$29,892	\$385,275	\$335,220	\$50,055
Number employed on vessels.....	1,517	1,291	226	533	466	67	984	825	159
Wages.....	\$593,600	\$518,139	\$75,461	\$195,163	\$174,173	\$20,990	\$398,437	\$343,966	\$54,471
Freight carried (tons of 2,000 pounds).....	197,069	185,844	11,225	78,352	76,518	1,834	118,717	109,326	9,391

¹ Includes 3 fishing boats.

² Exclusive of 2,250 tons of freight lightered.

DIAGRAM 1.—GROSS TONNAGE OF VESSELS PROPELLED BY MACHINERY, OPERATING ON CANALS AND OTHER INLAND WATERS: 1916.

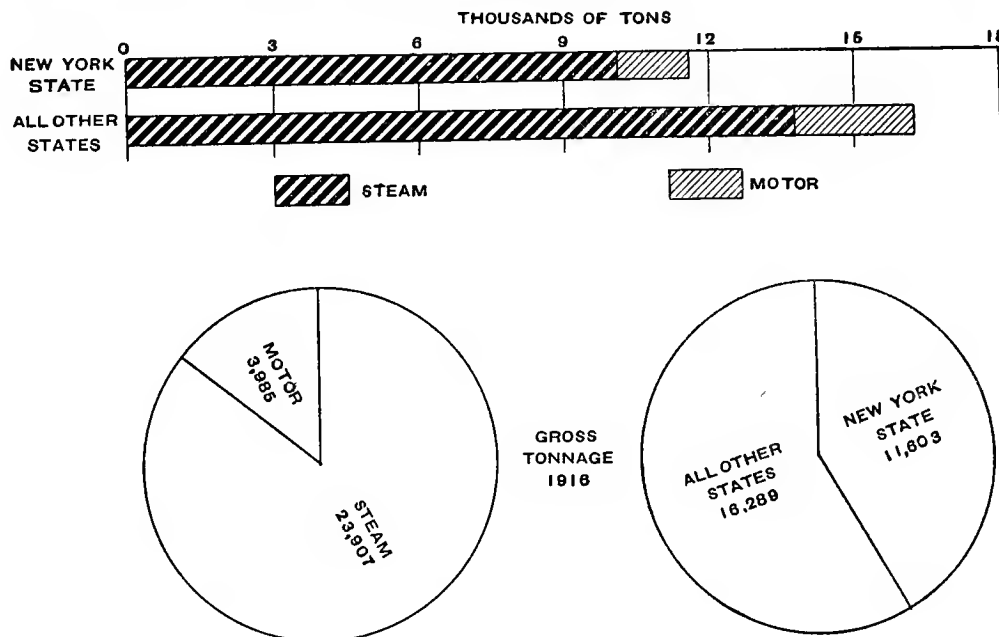


DIAGRAM 2.—VALUE OF VESSELS PROPELLED BY MACHINERY, OPERATING ON CANALS AND OTHER INLAND WATERS: 1916.

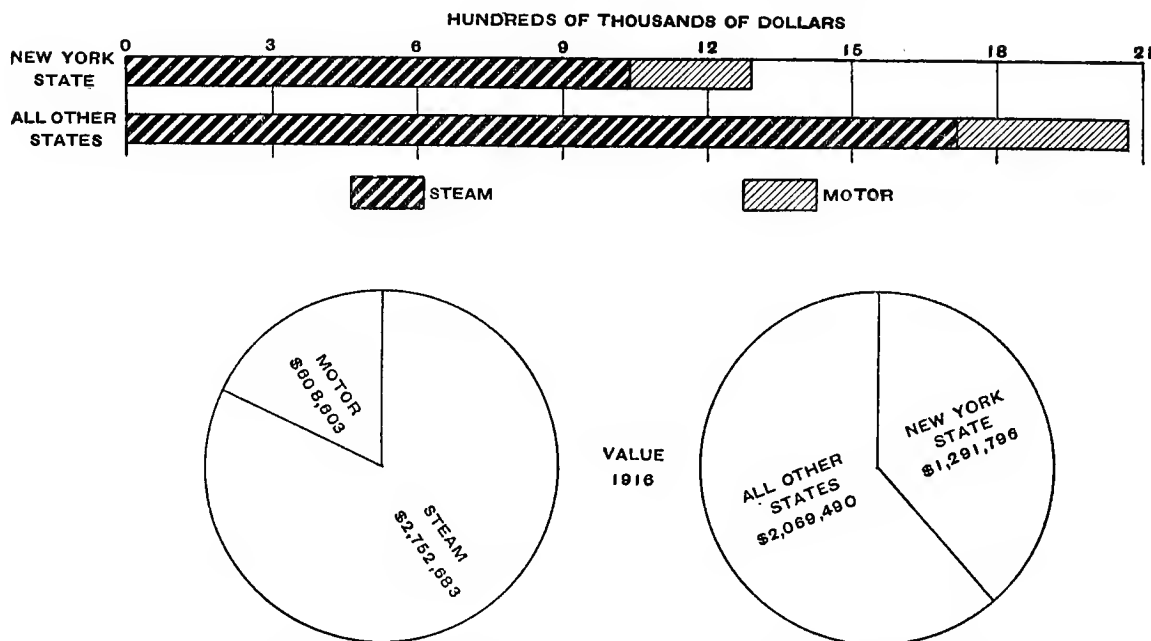
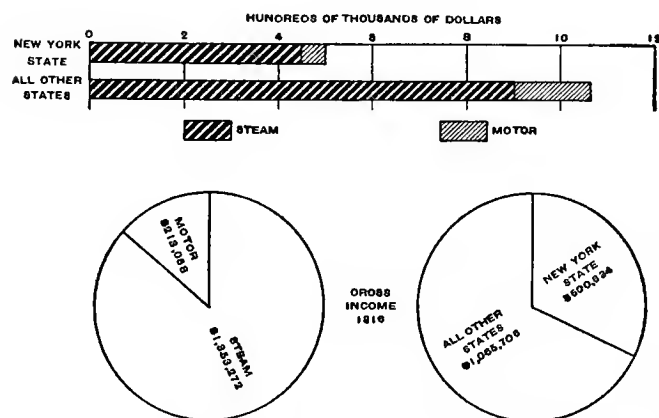


DIAGRAM 3.—GROSS INCOME OF VESSELS PROPELLED BY MACHINERY, OPERATING ON CANALS AND OTHER INLAND WATERS: 1916.



Steam craft led in all details presented in Table 6. Although about two-fifths of the total number of vessels were motor driven, their proportion in other details was much less. A comparison of some of the more important items for New York and for all other states shows that the proportions for all other states were considerably greater, the proportions being as follows: For total number of vessels, 70.5 per cent; gross tonnage, 58.4 per cent; horsepower, 64.8 per cent; value of vessels, 61.6 per cent; income, 68 per cent; and freight carried, 60.2 per cent.

Table 7 shows statistics for the steam and motor vessels operated on the canals of New York state and of all other states in 1916.

TABLE 7.—VESSELS PROPELLED BY MACHINERY OPERATING ON CANALS OF NEW YORK STATE AND OF ALL OTHER STATES: 1916.

	AGGREGATE.			NEW YORK.			ALL OTHER STATES.		
	Total.	Steam.	Motor.	Total.	Steam.	Motor.	Total.	Steam.	Motor.
Number of vessels.....	112	94	18	84	73	11	28	21	7
Gross tonnage.....	5,741	5,372	369	4,725	4,476	249	1,016	896	120
Horsepower.....	7,745	7,053	692	6,088	5,546	542	1,657	1,507	150
Value of vessels.....	\$440,422	\$382,272	\$58,150	\$328,250	\$280,700	\$47,550	\$112,172	\$101,572	\$10,600
Gross income.....	\$323,984	\$302,008	\$21,976	\$211,885	\$198,376	\$13,509	\$112,099	\$103,632	\$8,467
Freight.....	\$93,234	\$91,034	\$2,200	\$63,343	\$63,143	\$200	\$29,891	\$27,891	\$2,000
Passengers.....	\$4,720	\$2,050	\$2,670	\$2,750	\$2,050	\$700	\$1,970	.....	\$1,970
All other sources.....	\$226,030	\$208,924	\$17,106	\$145,792	\$133,183	\$12,609	\$80,238	\$75,741	\$4,497
Number employed on vessels.....	316	298	18	235	225	10	81	73	8
Wages.....	\$160,301	\$152,014	\$8,287	\$107,363	\$101,963	\$5,400	\$52,938	\$50,051	\$2,887
Freight carried (tons of 2,000 pounds).....	95,235	92,935	2,300	63,988	63,788	200	31,247	29,147	2,100

In direct contrast with the showing in Table 6, when figures are presented for vessels propelled by machinery which operated on canals only, as in Table 7, the proportions for New York state greatly pre-

dominate over those for all other states. New York reported 75 per cent of the total number of such vessels, 82.3 per cent of the tonnage, 74.5 per cent of their value, and 65.4 per cent of the gross income. The motor-driven craft on the canals were considerably less important than the steam vessels, the only instance in which motor boats exceeded steam vessels being in the item "income from passengers,"

for which their proportion was 56.6 per cent. In 1916, of the 73 steam vessels operating on the canals of New York state, 42, with a gross tonnage of 1,362, valued at \$145,500, were used for towing.

Table 8 shows figures for all vessels and craft, classified by occupation, operating on canals and other inland waters of the United States for 1916 and 1906.

TABLE 8.—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS, BY OCCUPATION, WITH PER CENT OF INCREASE AND PER CENT OF TOTAL: 1916 AND 1906.

OCCUPATION.	Census year.	VESSELS.		TONNAGE.		VALUE OF VESSELS.		GROSS INCOME.		EMPLOYED ON VESSELS.		WAGES.	
		Number.	Per cent of total.	Gross tons.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.	Number.	Per cent of total.	Amount.	Per cent of total.
Total.....	1916	2,049	100.0	196,426	100.0	\$5,744,486	100.0	\$4,179,481	100.0	3,168	100.0	\$1,263,885	100.0
	1906	2,140	100.0	259,491	100.0	4,586,791	100.0	3,957,729	100.0	3,731	100.0	1,361,030	100.0
Per cent of increase ¹		-4.3		-24.3		25.2		5.6		-15.1		-7.1	
Commercial vessels.....	1916	1,903	92.9	193,857	98.7	5,347,217	93.1	4,155,883	99.5	3,052	96.3	1,223,855	96.8
	1906	2,039	95.3	257,309	99.2	4,076,269	88.9	3,934,032	99.4	3,599	96.5	1,317,275	96.8
Per cent of increase ¹		-6.7		-24.7		31.2		5.7		-15.2		-7.1	
Freight and passenger.....	1916	262	12.8	19,084	9.7	2,222,627	38.7	974,925	23.3	908	28.7	308,529	24.4
	1906	170	7.9	16,803	6.5	1,283,987	28.0	713,020	18.0	737	19.8	237,830	17.5
Per cent of increase.....		54.1		13.6		73.1		36.7		23.2		29.7	
Ferryboats.....	1916	17	0.8	503	0.3	64,750	1.1	58,179	1.4	24	0.8	13,069	1.0
	1906	5	0.2	307	0.1	86,500	1.9	35,150	0.9	17	0.5	8,154	0.6
Per cent of increase ¹				63.8		-25.2		65.5				60.3	
Tugs and other towing vessels.....	1916	154	7.5	5,958	3.0	681,690	11.9	497,946	11.9	468	14.8	228,242	18.1
	1906	75	3.5	2,733	1.1	361,464	7.9	298,452	7.5	278	7.5	124,015	9.1
Per cent of increase.....				118.0		88.6		66.8		68.3		84.0	
Unrigged craft.....	1916	1,470	71.7	168,312	85.7	2,378,150	41.4	2,624,833	62.8	1,652	52.1	674,015	53.3
	1906	1,789	83.6	237,466	91.5	2,344,318	51.1	2,888,010	73.0	2,567	68.8	947,276	69.6
Per cent of increase ¹		-17.8		-29.1		1.4		-9.1		-35.6		-28.8	
Yachts.....	1916	124	6.1	2,004	1.0	350,219	6.1	1,010	(²)	74	2.3	26,126	2.1
	1906	85	4.0	1,476	0.6	474,872	10.4	640	(²)	100	2.7	31,891	2.3
Per cent of increase ¹				35.8		-26.2		57.8		-26.0		-18.1	
Miscellaneous.....	1916	22	1.1	565	0.3	47,050	0.8	22,588	0.5	42	1.3	18,904	1.1
	1906	16	0.7	706	0.3	35,650	0.8	22,457	0.6	32	0.9	11,864	0.9
Per cent of increase ¹				-20.0		32.0		0.6				17.2	

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

² Less than one-tenth of 1 per cent.

Of vessels operating on canals and other inland waters of the United States, 92.9 per cent were used for commercial purposes in 1916 and 95.3 per cent in 1906, the unrigged craft representing 71.7 per cent of the total in 1916, compared with 83.6 per cent in 1906. The tonnage of the unrigged, which formed 91.5 per cent of the total in 1906, decreased to 85.7 per cent in 1916, and their value, notwithstanding a slight actual increase, decreased from 51.1 per cent of the total in 1906 to 41.4 per cent at the later census. Tugs and other towing vessels increased actually and relatively during the decade in all items shown in the table.

The few vessels reported besides those classified as commercial were yachts used for pleasure and miscellaneous kinds of vessels, which class was made up of craft used for the inspection, repair, and care of rivers and canals, and other purposes.

Table 9 shows, by occupation, the number, tonnage, and value of unrigged vessels for 1916 and 1906.

TABLE 9.—UNRIGGED VESSELS, BY OCCUPATION, WITH PER CENT OF TOTAL: 1916 AND 1906.

OCCUPATION AND CENSUS YEAR.	Num-ber of ves-sels.	Per cent of total.	Gross tonnage.	Per cent of total.	Value of vessels.	Per cent of total.
Total:						
1916.....	1,470	100.0	168,312	100.0	\$2,378,150	100.0
1906.....	1,789	100.0	237,466	100.0	2,344,318	100.0
Canal boats:						
1916.....	1,056	71.8	134,390	79.8	1,288,315	54.2
1906.....	1,566	87.5	198,247	83.5	1,821,822	77.7
All other unrigged:						
1916.....	414	28.2	33,922	20.2	1,089,835	45.8
1906.....	223	12.5	39,219	16.5	522,496	22.3

¹ Exclusive of 445 canal boats located chiefly in New York Harbor.

As regards the number, tonnage, and value of the unrigged craft, canal boats outranked the miscellaneous craft in 1916 as in 1906, although at a reduced proportion, their value decreasing from 77.7 per cent of the total in 1906 to 54.2 per cent in 1916. The miscellaneous craft consisted largely of scows, lighters, barges, dredges, etc.

NUMBER AND TONNAGE OF VESSELS.

Table 10 shows vessels grouped according to gross tonnage, by division and class, with per cent of increase, for 1916 and 1906.

In the group of largest tonnage—"1,000 to 2,499 tons"—there were but 4 vessels in 1916 as in 1906, representing both steam and unrigged craft. In 1916, 3 of these vessels were operated in New York waters, and 1 of 1,195 tons was employed in other inland waters; in 1906 all were reported from New York. At both censuses the largest number and tonnage of ves-

sels of all kinds combined were in the group of "100 to 199 tons." In considering number of vessels only, the group "5 to 49 tons" was second. In 1916, 78.9 per cent of the number of steam craft, and in 1906, 66.5 per cent, were reported in the class of from "5 to 49 tons"; at each census the largest proportion of unrigged craft—59.2 per cent in 1916 and 73.2 per cent in 1906—was reported in the group "100 to 199 tons." Although there was a decrease in this group of one-third both in number and tonnage of vessels from 1906 to 1916, it led all other groups in both respects in 1916 as in 1906.

TABLE 10.—VESSELS GROUPED ACCORDING TO GROSS TONNAGE, BY DIVISION AND CLASS, WITH PER CENT OF INCREASE: 1916 AND 1906.

DIVISION AND CLASS.	Cen- sus year.	TOTAL.		5 TO 49 TONS.		50 TO 99 TONS.		100 TO 199 TONS.		200 TO 299 TONS.		300 TO 399 TONS.		400 TO 499 TONS.		500 TO 999 TONS.		1,000 TO 2,499 TONS.	
		Number of ves- sels.	Gross tonnage.	Number of ves- sels.	Gross ton- nage.	Number of ves- sels.	Gross ton- nage.	Number of ves- sels.	Gross ton- nage.	Number of ves- sels.	Gross ton- nage.	Number of ves- sels.	Gross ton- nage.	Number of ves- sels.	Gross ton- nage.	Number of ves- sels.	Gross ton- nage.	Number of ves- sels.	Gross ton- nage.
Total.....	1916	2,049	196,426	685	14,337	260	18,824	914	109,809	167	38,924	8	2,583	1	450	10	6,434	4	5,065
	1906	2,140	259,491	271	5,184	255	20,505	1,371	164,817	187	43,435	32	11,002	13	5,319	7	4,634	4	4,595
Per cent of in- crease ¹		-4.3	-24.3	152.8	176.6	2.0	-8.2	-33.3	-33.4	-10.7	-10.4	.....	-76.5	.....	-91.5	.....	38.8	.....	10.2
Steam ²	1916	574	27,856	453	8,633	61	4,301	42	5,562	11	2,708	1	323	.....	.....	3	2,334	3	3,995
	1906	337	21,507	224	4,041	41	2,980	59	7,681	6	1,440	2	667	.....	469	.....	1,634	2	2,595
Per cent of increase ¹		70.3	29.5	102.2	113.6	.....	443	.....	-27.6	.....	88.1	.....	-51.6	.....	.....	.....	42.8	.....	53.9
Sail.....	1916	5	258	3	45	.....	.....	2	213	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1906	14	518	10	126	2	183	2	209	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Per cent of increase ¹.....		.....	-50.2	.....	-64.3	.....	.....	.....	1.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	1916	1,470	168,312	229	5,659	199	14,523	870	104,034	156	36,216	7	2,260	1	450	7	4,100	1	1,070
	1906	1,789	237,466	37	1,017	212	17,342	1,310	156,927	181	41,995	30	10,335	12	4,850	5	3,000	2	2,000
Per cent of increase ¹		-17.8	-29.1	.....	456.4	-6.1	-16.3	-33.6	-33.7	-13.8	-13.8	.....	-78.1	.....	-90.7	.....	36.7	.....	-46.5
NEW YORK STATE.....	1916	978	115,290	159	3,755	112	8,323	573	67,040	123	29,352	6	1,900	1	450	1	600	3	3,870
	1906	1,648	209,152	105	1,990	193	16,244	1,153	136,313	174	40,676	1	300	11	4,400	7	4,634	4	4,595
Per cent of in- crease ¹		-40.7	-44.9	51.4	88.7	-42.0	-48.8	-50.3	-50.8	-29.3	-27.8	.....	533.3	.....	-89.8	.....	-87.1	.....	-15.8
Steam ²	1916	170	11,603	116	2,410	18	1,334	28	3,613	6	1,446	.....	.....	.....	.....	.....	.....	2	2,800
	1906	151	14,127	80	1,523	17	1,145	45	5,924	4	1,006	1	300	.....	.....	2	1,634	2	2,595
Per cent of in- crease ¹		12.6	-17.9	.....	58.2	.....	16.5	.....	-39.0	.....	43.7	.....	.....	.....	.....	.....	.....	.....	7.9
Sail.....	1916	4	150	3	45	.....	.....	1	105	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1906	13	495	9	103	2	183	2	209	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Per cent of in- crease ¹.....		.....	-69.7	.....	-56.3	.....	.....	.....	-49.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	1916	804	103,537	40	1,300	94	6,989	544	63,322	117	27,906	6	1,900	1	450	1	600	1	1,070
	1906	1,484	194,530	16	364	174	14,916	1,106	130,180	170	39,670	.....	.....	11	4,400	5	3,000	2	2,000
Per cent of in- crease ¹		-45.8	-46.8	.....	257.1	-46.0	-53.1	-50.8	-51.4	-31.2	-29.7	.....	.....	.....	-89.8	.....	-80.0	.....	-46.5
ALL OTHER STATES.....	1916	1,071	81,136	526	10,582	148	10,501	341	42,769	44	9,572	2	683	.....	.....	9	5,834	1	1,195
	1906	492	50,339	166	3,194	62	4,261	218	28,504	13	2,759	31	10,702	2	919	.....	.....	.....	.....
Per cent of in- crease ¹		117.7	61.2	216.9	231.3	.....	146.4	56.4	50.0	.....	246.9	.....	-93.6	.....	.....	.....	.....	.....	.....
Steam ²	1916	404	16,253	337	6,223	43	2,967	14	1,949	5	1,262	1	323	.....	.....	3	2,334	1	1,195
	1906	186	7,380	144	2,518	24	1,835	14	1,757	2	434	1	367	1	469	.....	.....	.....	.....
Per cent of in- crease ¹		117.2	120.2	134.0	147.1	.....	61.7	.....	10.9	.....	190.8	.....	-12.0	.....	.....	.....	.....	.....	.....
Sail.....	1916	1	108	.....	.....	.....	.....	1	108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1906	1	23	.....	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	1916	666	64,775	189	4,359	105	7,534	326	40,712	39	8,310	1	360	.....	.....	6	3,500	.....	.....
	1906	305	42,936	21	653	38	2,426	204	26,747	11	2,325	30	10,335	1	450	.....	.....	.....	.....
Per cent of in- crease ¹		118.4	50.9	.....	567.5	.....	210.6	59.8	52.2	.....	257.4	.....	-96.5	.....	.....	.....	.....	.....	.....

¹ A minus sign (—) denotes decrease. Percentages are omitted when base is less than 100.

² Includes craft propelled by machinery.

OWNERSHIP OF VESSELS.

Table 11 shows the number, gross tonnage, and value of vessels, by character of ownership, for 1916 and 1906.

In 1906 vessels under individual ownership on the inland waters of the United States ranked first in number of vessels, gross tonnage, and value, but in 1916, although still first in number, they were second

to vessels of corporate ownership in tonnage and in value. In 1916 corporations reported 46.6 per cent of the total tonnage and 59.8 per cent of the value, compared with 34 per cent and 45 per cent, respectively, in 1906. The value of vessels reported by corporations increased 66.3 per cent during the 10 years, while their number increased only 16.6 per cent and the tonnage 3.7 per cent.

TABLE 11.—NUMBER, GROSS TONNAOE, AND VALUE OF VESSELS, BY CHARACTER OF OWNERSHIP, WITH PER CENT OF TOTAL: 1916 AND 1906.

OWNERSHIP AND CENSUS YEAR.	VESSELS.		TONNAGE.		VALUE OF VESSELS.	
	Number.	Per cent of total.	Gross tons.	Per cent of total.	Amount.	Per cent of total.
Total:						
1916	2,049	100.0	196,426	100.0	\$5,744,486	100.0
1906	2,140	100.0	259,491	100.0	4,586,791	100.0
Individual:						
1916	920	44.9	87,994	44.8	1,740,792	30.3
1906	1,328	62.1	160,359	61.8	2,320,100	50.6
Firm:						
1916	217	10.6	11,714	6.0	343,800	6.0
1906	83	3.9	7,993	3.1	125,200	2.7
Incorporated company:						
1916	812	39.6	91,569	46.6	3,432,776	59.8
1906	696	32.5	88,331	34.0	2,064,641	45.0
All other:						
1916	100	4.9	5,149	2.6	227,118	4.0
1906	33	1.5	2,808	1.1	76,850	1.7

Table 12 shows for the different classes of vessels, the number and gross tonnage, by occupation and character of ownership for 1916 and 1906.

At the census of 1916 the largest number of steam freight and passenger vessels and by far the greatest tonnage of such vessels was owned by corporations, thus not only reversing the conditions in 1906 in point of number, but increasing the precedence in point of tonnage. Corporation ownership of steam tugs and other towing vessels predominated, both in number and in tonnage, at both censuses, but leadership in ferryboats changed from corporate ownership in 1906 to individual ownership in 1916. Yachts were principally owned by individuals both in 1916 and 1906. At both censuses a greater proportion of the number and tonnage of the unrigged craft was owned by individuals, although the proportions were greatly decreased at the later census.

TABLE 12.—NUMBER AND GROSS TONNAGE OF VESSELS, BY CHARACTER OF OWNERSHIP AND BY OCCUPATION: 1916 AND 1906.

CLASS AND OCCUPATION.	Census year.	TOTAL.		INDIVIDUAL.		FIRM.		INCORPORATED COMPANY.		ALL OTHER.	
		Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.
Total.....	1916	2,049	196,426	920	87,994	217	11,714	812	91,569	100	5,149
	1906	2,140	259,491	1,328	160,359	83	7,993	696	88,331	33	2,808
Steam ¹	1916	574	27,856	276	7,915	60	1,296	214	17,889	24	765
	1906	337	21,507	191	8,557	22	858	114	11,698	10	394
Freight and passenger.....	1916	260	18,946	102	4,169	24	694	134	14,083	.....	.....
	1906	166	16,477	85	6,046	12	618	66	9,577	3	236
Tugs and other towing vessels.....	1916	154	5,958	50	1,596	16	328	73	3,539	15	495
	1906	75	2,733	28	1,035	5	59	38	1,519	4	120
Ferryboats.....	1916	17	503	10	235	2	27	3	184	2	57
	1906	5	307	.....	.....	1	5	4	302	.....	.....
Yachts.....	1916	121	1,884	108	1,735	9	75	4	74	.....	.....
	1906	75	1,284	69	1,226	2	15	2	19	2	24
Miscellaneous ²	1916	22	585	6	180	9	172	.....	.....	7	213
	1906	16	706	9	250	2	161	4	281	1	14
Sail.....	1916	5	258	5	258	.....	.....	.....	.....	.....	.....
	1906	14	518	14	518	.....	.....	.....	.....	.....	.....
Freight and passenger.....	1916	2	138	2	138	.....	.....	.....	.....	.....	.....
	1906	4	326	4	326	.....	.....	.....	.....	.....	.....
Yachts.....	1916	3	120	3	120	.....	.....	.....	.....	.....	.....
	1906	10	192	10	192	.....	.....	.....	.....	.....	.....
Unrigged.....	1916	1,470	168,312	639	79,821	157	10,418	598	73,689	76	4,384
	1906	1,789	237,466	1,123	151,284	61	7,135	582	76,633	23	2,414

¹ Includes craft propelled by machinery.

² Exclusive of three fishing vessels, as fishing vessels were not included in 1906.

CONSTRUCTION.

Table 13 shows the number, gross tonnage, and value of vessels, by character of construction, for the years 1916, 1906, and 1889.

In 1916 there were only 44 boats constructed of metal operating on canals and other inland waters and of this number 37 were steam vessels and 7 unrigged. The vessels of composite construction formed

a very small proportion of the total, both in 1916 and 1906, only 13, with a tonnage of 947, being reported in 1916, and 6, with a tonnage of 188, in 1906. All of these in 1916 and all except 1 in 1906 were steam vessels. No vessels of composite construction were reported in 1889.

The number of steam vessels of all kinds operating on canals and other inland waters increased by 237, or 70.3 per cent, from 1906 to 1916; the tonnage in-

TRANSPORTATION BY WATER.

creased 6,349, or 29.5 per cent; and the value relative gains were greater during the period from 1889 \$1,132,013, or 50.9 per cent. Except in tonnage, the to 1906.

TABLE 13.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS, BY CHARACTER OF CONSTRUCTION: 1916, 1906, AND 1889.

CLASS AND OCCUPATION.	Census year.	TOTAL.			METAL.			WOOD.			COMPOSITE.		
		Number of ves-sels.	Gross tonnage.	Value of vessels.	Number of ves-sels.	Gross tonnage.	Value of vessels.	Number of ves-sels.	Gross tonnage.	Value of vessels.	Number of ves-sels.	Gross tonnage.	Value of vessels.
Total.....	1916	2,049	196,426	\$5,744,486	44	8,165	\$1,383,297	1,992	187,314	\$4,209,354	13	947	\$151,835
	1906	2,140	250,491	4,586,791	22	6,705	767,315	2,112	252,598	3,800,176	6	188	19,300
	1889	6,575	996,629	6,138,914	6	1,404	109,000	6,569	935,225	6,029,914			
Steam ¹	1916	574	27,856	3,357,686	37	7,836	1,274,872	524	19,073	1,930,979	13	947	151,835
	1906	337	21,507	2,225,673	12	5,103	673,325	320	16,319	1,533,848	5	85	18,500
	1889	163	19,223	790,000	6	1,404	109,000	157	17,819	681,000			
Freight and passenger.....	1916	260	18,946	2,220,927	20	6,862	1,084,338	230	11,392	1,018,589	10	692	118,000
	1906	166	16,477	1,281,737	5	4,386	489,625	161	12,091	792,112			
	1889	150	18,174	690,500	6	1,404	109,000	144	16,770	581,500			
Tugs and other towing vessels..	1916	154	5,958	681,690	13	756	143,534	140	4,974	513,821	1	228	24,335
	1906	75	2,733	361,464	4	534	92,000	67	2,139	254,964	4	60	14,500
	1889	6	652	61,000				6	652	61,000			
Ferryboats.....	1916	17	503	64,750	1	171	25,000	16	332	39,750			
	1906	5	307	86,500				5	307	86,500			
	1889	1	5	1,500				1	5	1,500			
Yachts.....	1916	121	1,884	343,269	2	35	19,000	117	1,822	314,769	2	27	9,500
	1906	75	1,284	460,322	3	183	91,700	71	1,076	364,622	1	25	4,000
	1889	3	74	19,000				3	74	19,000			
Miscellaneous.....	1916	22	565	47,050	1	12	3,000	21	553	44,050			
	1906	16	706	35,650				16	706	35,650			
	1889	3	318	18,000				3	318	18,000			
Sail.....	1916	5	258	8,650				5	258	8,650			
	1906	14	518	16,800				14	518	16,800			
	1889	25	1,925	36,800				25	1,925	36,800			
Freight and passenger.....	1916	2	138	1,700				2	138	1,700			
	1906	4	326	2,250				4	326	2,250			
	1889	25	1,925	36,800				25	1,925	36,800			
Yachts.....	1916	3	120	6,950				3	120	6,950			
	1906	10	192	14,550				10	192	14,550			
Unrigged ²	1916	1,470	168,312	2,378,150	7	329	108,425	1,463	167,983	2,269,725			
	1906	1,789	237,466	2,311,318	10	1,602	93,960	1,778	235,761	2,249,528	1	103	800
	1889	6,387	975,481	5,312,114				6,387	975,481	5,312,114			

¹ Includes craft propelled by machinery.

² The character of construction of unrigged craft was not reported in 1889, but for purposes of comparison in this table all were assumed to be of wood.

Considering separately the class of steam vessels of metal construction operating on these inland waters, the absolute and relative increase in number during the period from 1906 to 1916, 25, or 208.3 per cent, and the absolute increase in value, \$601,547, were greater than the corresponding increases from 1889 to 1906. The earlier period, however, showed greater absolute and relative increases in tonnage, 3,699, or 263.5 per cent, and a greater relative increase in value, 517.7 per cent.

The increase in number of wooden steam vessels in 1916 over those reported for 1906 was 204, or 63.8 per cent, compared with a gain of 163, or 103.8 per cent, from 1889 to 1906. The tonnage increased during the later period by 2,754 tons, or 16.9 per cent, compared with a decrease of 1,500, or 8.4 per cent, for the preceding period. The value of these wooden vessels increased \$397,131, or 25.9 per cent, from 1906 to 1916, compared with \$852,848, or 125.2 per cent, from 1889 to 1906. Comparing the increase in the use of metal steam craft with the increase in that of wooden vessels, the gain in number of wooden vessels operated was greater during both periods. In ton-

nage the absolute gain was greater for wooden vessels from 1906 to 1916, but the absolute increase in value of metal vessels exceeded that reported for wooden vessels for the same period.

Table 14 shows the number, tonnage, and value of canal boats, by character of construction, for 1916 and 1906.

TABLE 14.—CANAL BOATS, BY CHARACTER OF CONSTRUCTION: 1916 AND 1906.

CONSTRUCTION AND CENSUS YEAR.	Number of vessels.	Gross tonnage.	Value of vessels.
Total:			
1916.....	¹ 1,056	134,390	\$1,288,315
1906.....	1,566	198,247	1,821,822
Metal:			
1916.....			
1906.....	9	602	18,500
Wood:			
1916.....	1,056	134,390	1,288,315
1906.....	1,556	197,542	1,802,322
Composite:			
1916.....			
1906.....	1	103	800

¹ Exclusive of 445 canal boats located chiefly in New York Harbor.

During the 10 years 1906–1916 the number of canal boats decreased 32.6 per cent, their total ton-

nage 32.2 per cent, and their total value 29.3 per cent. The table does not include figures for steam vessels operating wholly on canals.

Table 15 shows the average tonnage and value per vessel and the average value per ton, by character of construction, for 1916, 1906, and 1889.

TABLE 15.—AVERAGE GROSS TONNAGE AND VALUE PER VESSEL AND AVERAGE VALUE PER TON:
1916, 1906, AND 1889.

CLASS AND OCCUPATION.	Census year.	TOTAL.			METAL.			WOOD.			COMPOSITE.		
		Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.
Total.....	1916	96	\$2,804	\$29	186	\$31,439	\$169	94	\$2,113	\$22	73	\$11,680	\$160
	1906	121	2,143	18	305	34,878	114	120	1,799	15	31	3,217	103
	1889	152	934	6	234	18,167	78	152	918	6			
Steam ¹	1916	49	5,850	121	212	34,456	163	36	3,685	101	73	11,680	160
	1906	64	6,604	103	425	56,110	132	51	4,793	94	17	3,700	218
	1889	118	4,847	41	234	18,167	78	114	4,338	38			
Freight and passenger.....	1916	73	8,542	117	343	54,217	158	50	4,429	89	69	11,800	171
	1906	99	7,721	78	877	97,925	112	75	4,920	66			
	1889	121	4,603	38	234	18,167	78	116	4,038	35			
Tugs and other towing vessels.....	1916	39	4,426	114	58	11,041	190	36	3,670	103	228	24,335	107
	1906	36	4,820	132	133	23,000	172	32	3,805	119	15	3,625	242
	1889	109	10,167	94				109	10,167	94			
Ferryboats.....	1916	30	3,809	129	171	25,000	146	21	2,484	120			
	1906	61	17,300	282				61	17,300	282			
	1889	5	1,500	300				5	1,500	300			
Yachts.....	1916	16	2,837	182	18	9,500	543	16	2,690	173	14	4,750	352
	1906	17	6,138	358	61	30,567	501	15	5,136	339	25	4,000	160
	1889	25	6,333	257				25	6,333	257			
Miscellaneous.....	1916	26	2,139	83	12	3,000	250	26	2,098	80			
	1906	44	2,228	50				44	2,228	50			
	1889	106	6,000	57				106	6,000	57			
Sail.....	1916	52	1,730	34				52	1,730	34			
	1906	37	1,200	32				37	1,200	32			
	1889	77	1,472	19				77	1,472	19			
Freight and passenger.....	1916	69	850	12				69	850	12			
	1906	82	562	7				82	562	7			
	1889	77	1,472	19				77	1,472	19			
Yachts.....	1916	40	2,317	58				40	2,317	58			
	1906	19	1,455	76				19	1,455	76			
	1889												
Unrigged.....	1916	114	1,618	14	47	15,489	330	115	1,551	14			
	1906	133	1,310	10	160	9,399	59	132	1,265	10	103	800	8
	1889	153	832	5				153	832	5			

¹ Includes craft propelled by machinery.

The average tonnage per vessel for all classes combined has decreased at each census since 1889, while, on the other hand, the average value per vessel and per ton has increased. The average tonnage and the average value per vessel of metal construction increased during the earlier period but decreased during the later, while the average value per ton increased continuously. The average tonnage of wooden vessels decreased from census to census, but the average value per vessel and average value per ton increased. The several averages for vessels of composite construction increased noticeably during the 10 years from 1906 to 1916.

The details of averages for metal steam vessels agree, in the general trend, with all metal craft, but the average value per vessel of wooden steam craft shows a decrease from 1906 to 1916, although the contrary is true of the showing for the total for wooden vessels of all kinds.

All craft of composite construction operating on canals and all other inland waters in 1916 were steam vessels. In 1906 one unrigged craft of this construction was reported, which has since ceased operating as an active craft. The average value per vessel of the composite steam craft shows a smaller increase during the 10 years than the showing for the composite vessels as a whole, and the average value per ton has actually decreased.

The total averages for sailing craft, all of which were of wooden construction, show an increase in the tonnage and value per vessel during the period 1906 to 1916, following a decrease for the previous period. The average value per ton has continuously increased.

The continuing decrease of average tonnage per vessel is shown also in the totals for unrigged craft, with increases in the average value per vessel and per ton. These conditions are specially marked in

unrigged craft of metal construction, the increase from 1906 to 1916 in average value per vessel of this construction being 64.8 per cent and in average value per ton 459.3 per cent. Average tonnage per vessel of the wooden unrigged craft decreased at each census, but the average value per vessel and per ton increased. The composite type of unrigged, for which averages were shown for 1906, was not reported for 1916.

Considering the craft by occupations, the averages for ferryboats of all classes of construction combined, as well as for those of wooden construction, show marked decreases from 1906 to 1916. Ferryboats of metal construction appeared in 1916 for the first time, with large averages per vessel. The average tonnage for the freight and passenger steam vessels decreased at each census, but the average values per vessel and per ton increased, due principally to the introduction of vessels of the composite type.

The averages for steam yachts decreased at each census, except that the average value per ton showed an increase from 1889 to 1906. The average value per ton of steam yachts of metal construction increased from 1906 to 1916, as well as the average tonnage of yachts of wooden construction and the average value per vessel and per ton of yachts of composite construction.

Steam tugs and other towing vessels of composite construction show a very great increase in average tonnage and value per vessel, far exceeding freight and passenger vessels in these averages for 1916. The average value per ton, however, decreased.

INCOME.

Table 16 shows the income from vessels operating on the canals and other inland waters of New York state and of all other states for 1916 and 1906.

The increase from 1906 to 1916 in total gross income of all craft was \$221,752, or 5.6 per cent, due principally to an increase in receipts from miscellaneous sources, which included towing, lightering, and dredging. There was a considerable decrease in the income from freight, although the receipts from this latter source still form the largest item of income and, notwithstanding its relative importance, dropped from 70.4 per cent of the total in 1906 to 48 per cent in 1916.

Canals and other inland waters of New York state reported 51.2 per cent of the total income in 1916; 57.2 per cent of the income from freight; 23.2 per cent of the income from passengers; and 54.7 per cent of the income from miscellaneous sources. This is a marked change from the showing for 1906, when the percentages were 70.3, 78.9, 61.6, and 43, respectively.

The great bulk of the total income and of that from freight and miscellaneous sources was reported by towing vessels and unrigged craft. The decrease in total receipts for this class of craft is due wholly to the reduction in transportation on the canals and other inland waters of New York state. The increase in total receipts of craft operating on the inland waters of all

other states was \$864,799, or 73.5 per cent. The increase in total receipts of towing vessels and unrigged craft reported from these waters was \$491,936, or 61.7 per cent. In 1916 these receipts were divided between freight, 53.3 per cent, and miscellaneous sources, 46.7 per cent; the receipts from the passenger traffic of these craft were insignificant.

TABLE 16.—GROSS INCOME—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS, BY DIVISIONS AND OCCUPATION, WITH PER CENT OF INCREASE: 1916 AND 1906.

DIVISION, OCCUPATION, AND CENSUS YEAR.	Total.	Freight.	Passenger.	All other.
Total:				
1916.....	\$4,179,481	\$2,004,189	\$628,092	\$1,547,200
1906.....	3,957,729	2,787,696	429,393	740,640
Per cent of increase ¹	5.6	-28.1	46.3	108.9
Freight and passenger—				
1916.....	974,925	259,833	606,825	108,267
1906.....	713,020	293,686	388,370	30,964
Per cent of increase ¹	36.7	-11.5	56.2	249.7
Towing vessels and unrigged craft—				
1916.....	3,122,779	1,735,494	881	1,386,404
1906.....	3,186,462	2,489,290	7,013	690,159
Per cent of increase ¹	-2.0	-30.3	-87.4	100.9
All other—				
1916.....	81,777	8,862	20,386	52,529
1906.....	58,247	4,720	34,010	19,517
Per cent of increase ¹	40.4	87.8	-40.1	169.1
New York state:				
1916.....	2,138,567	1,146,162	145,509	846,886
1906.....	2,781,904	2,198,920	264,397	318,287
Per cent of increase ¹	-23.1	-47.9	-45.0	166.1
Freight and passenger—				
1916.....	280,888	98,057	142,138	40,693
1906.....	387,489	108,648	259,037	19,804
Per cent of increase ¹	-27.5	-9.8	-45.1	105.5
Towing vessels and unrigged craft—				
1916.....	1,833,346	1,048,105	800	784,441
1906.....	2,388,965	2,090,272	1,350	297,343
Per cent of increase ¹	-23.3	-49.9	-40.8	163.8
All other—				
1916.....	24,323	.....	2,571	21,752
1906.....	5,150	.....	4,010	1,140
Per cent of increase ¹	372.3	.....	-35.9	1,808.1
All other states:				
1916.....	2,040,924	858,027	482,583	700,314
1906.....	1,176,125	588,776	164,996	422,353
Per cent of increase.....	73.5	45.7	192.5	65.8
Freight and passenger—				
1916.....	694,037	161,776	464,687	67,574
1906.....	325,531	185,038	129,333	11,160
Per cent of increase ¹	113.2	-12.6	259.3	505.5
Towing vessels and unrigged craft—				
1916.....	1,289,433	687,389	81	601,963
1906.....	797,497	399,018	5,663	392,816
Per cent of increase ¹	61.7	72.3	-98.6	53.2
All other—				
1916.....	57,454	8,862	17,815	30,777
1906.....	53,097	4,720	30,000	18,377
Per cent of increase ¹	8.2	87.8	-40.6	67.5

¹ A minus sign (—) denotes decrease.

DIAGRAM 4.—GROSS INCOME—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS, BY DIVISION AND SOURCE OF INCOME: 1916 AND 1906.

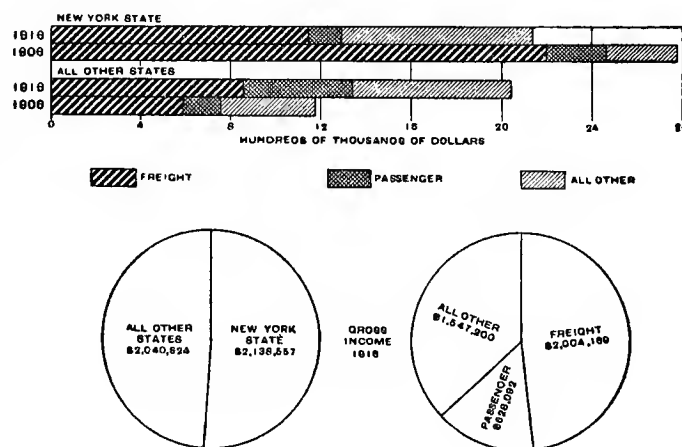
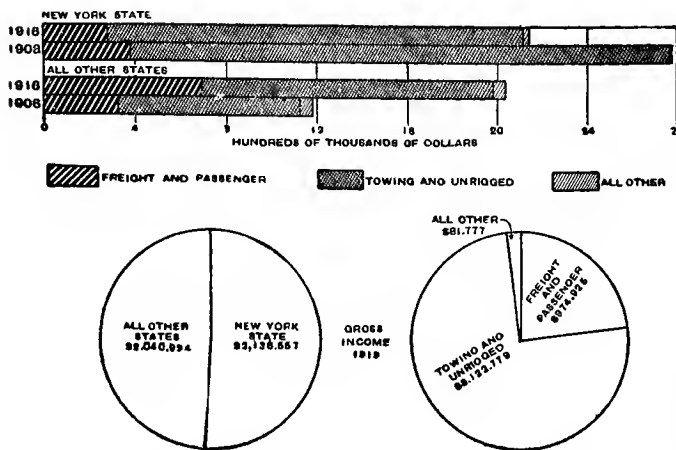


DIAGRAM 5.—GROSS INCOME—ALL VESSELS AND CRAFT, EXCLUSIVE OF FISHING VESSELS, BY DIVISION AND OCCUPATION: 1916 AND 1906.



EMPLOYEES AND SALARIES AND WAGES.

Table 17 shows the number of employees and salaries and wages for canals and other inland waters of New York state and of all other states, by divisions, for 1916 and 1906.

TABLE 17.—EMPLOYEES AND SALARIES AND WAGES, BY DIVISIONS: 1916 AND 1906.

DIVISION, EMPLOYEES, AND CENSUS YEAR.	Number of employees.	Salaries and wages.
Total:		
1916.....	3,674	\$1,474,378
1906.....	4,118	1,543,486
On vessels:		
1916.....	3,168	1,263,885
1906.....	3,731	1,361,030
On land:		
1916.....	506	210,493
1906.....	387	182,456
Officers, managers, clerks, etc.:		
1916.....	198	130,266
1906.....	126	81,497
All other:		
1916.....	308	80,227
1906.....	261	100,959
New York state:		
1916.....	1,656	674,220
1906.....	2,710	1,020,715
On vessels—		
1916.....	1,490	590,788
1906.....	2,472	920,260
On land—		
1916.....	166	83,432
1906.....	238	100,455
Officers, managers, clerks, etc.:		
1916.....	74	50,015
1906.....	92	54,695
All other		
1916.....	92	33,417
1906.....	146	45,760
All other states:		
1916.....	2,018	800,158
1906.....	1,408	522,771
On vessels—		
1916.....	1,678	673,097
1906.....	1,259	440,770
On land—		
1916.....	340	127,061
1906.....	149	82,001
Officers, managers, clerks, etc.—		
1916.....	124	80,251
1906.....	34	26,802
All other—		
1916.....	216	46,810
1906.....	115	55,199

The total number of employees and the amount paid in salaries and wages decreased from 1906 to 1916. These decreases, however, were confined to the canals and other inland waters of New York state. The total number of employees decreased 444, or 10.8 per cent;

salaries and wages, which included board and lodging, \$69,108, or 4.8 per cent. For canals and other inland waters of New York state the number of employees in 1916 decreased 1,054, or 38.9 per cent, and the salaries and wages \$346,495, or 33.9 per cent.

The number of employees on vessels in 1916 formed 86.2 per cent of the total employees, compared with 90.6 per cent in 1906, and their salaries and wages constituted 85.7 per cent of the total in 1916 and 88.2 per cent in 1906. In 1916 canals and other inland waters of New York state had a total of 1,656 employees—17.9 per cent less than the number reported for all other inland waters—and their salaries and wages amounted to \$674,220, or 15.7 per cent less than for the latter division, and represented 45.1 per cent of the total number of employees and 45.7 per cent of the total salaries and wages. In 1906 New York state had a total number of 2,710 employees, with salaries and wages of \$1,020,715, these being, respectively, 65.8 and 66.1 per cent of all reported.

In showing number and compensation of employees, no distinction has been made between wage earners and officers and clerks on vessels, but this segregation has been made for employees on land. Of the land force in 1916, 39.1 per cent were officers, managers, clerks, etc., compared with 32.6 per cent in 1906; and their salaries constituted 61.9 per cent of the total salaries and wages paid on land, compared with 44.7 per cent in 1906.

CHARACTER OF PROPULSION AND HORSEPOWER.

Table 18 shows, for vessels propelled by machinery on canals and all other inland waters, the occupation, character of propulsion, and horsepower of engines for 1916 and 1906.

TABLE 18.—CHARACTER OF PROPULSION AND HORSEPOWER OF VESSELS PROPELLED BY MACHINERY, BY OCCUPATION: 1916 AND 1906.

OCCUPATION AND CENSUS YEAR.	CHARACTER OF PROPULSION.				HORSEPOWER OF ENGINES.			
	Total.	Screw (number).	Side wheel (number).	Stern wheel (number).	Total.	Steam.	Gasoline.	All other.
Total:								
1916.....	574	464	14	96	43,085	35,160	7,925	.....
1906.....	337	285	18	34	28,126	28,402	1,708	16
Freight and passenger:								
1916.....	260	218	6	36	25,800	22,104	3,696	.....
1906.....	166	129	13	24	17,324	17,028	296	.....
Tugs and other towing vessels:								
1916.....	154	121	5	28	11,486	10,933	553	.....
1906.....	75	68	2	5	5,283	4,988	295	.....
Ferryboats:								
1916.....	17	8	3	6	586	214	372	.....
1906.....	5	2	3	.....	822	822	.....	.....
Yachts:								
1916.....	121	110	.....	11	4,618	1,661	2,957	.....
1906.....	75	73	.....	2	4,111	3,061	1,034	16
Miscellaneous:								
1916.....	22	7	.....	15	595	248	347	.....
1906.....	16	13	.....	3	586	503	83	.....

Vessels fitted with screw propellers greatly predominated, representing 80.8 per cent of the total in 1916, compared with 84.6 per cent in 1906.

The steam horsepower formed 81.6 per cent of the total in 1916, the proportion having decreased from 93.9 per cent in 1906. The proportion which the horsepower of gasoline engines formed of the total increased from 6.1 per cent in 1906 to 18.4 per cent in 1916. In 1906 gasoline engines were used most extensively by yachts, but in 1916 by freight and passenger vessels.

FREIGHT.

In considering the statistics of freight, it must be remembered that the figures were obtained from owners and managers of craft plying either wholly or in part on the canals and other inland waterways of the states, and not from official records or clearances kept by canal or other authorities. Under Census Office methods the freight of a boat operating on canals is classified according to the waters on which the greater part of its freight is carried or the greater part of its time is spent. Thus, all the freight boats operating partly on canals or other inland waterways of New York state but carrying more freight or spending a greater part of the season on the navigable rivers or in the harbors of New York are included under subdivisions of waters other than canals and other inland waters of New York state; as, for instance, under the Atlantic coast and Gulf of Mexico section of this report. The statistics, therefore, do not show separately all the freight carried on the canals and inland waters of the state.

Tables 1 and 30 are the only tables of this section showing the amount of freight lightered. Some of this lightering was done on the different canals of New York state and some in the harbors of New York and Buffalo. The total lighterage returned for the canals and other inland waters of New York state in 1916 was 296,982 tons, and that for all other inland waters, 219,871 tons. In 1906 this lighterage amounted to 209,590 tons for canals and all other inland waters of New York state and 18,300 tons for all other inland waters.

Table 19 shows the quantities of the various kinds of commodities shipped for 1916 and 1906.

TABLE 19.—FREIGHT SHIPPED, BY COMMODITIES: 1916 AND 1906.

COMMODITY.	QUANTITY (TONS OF 2,000 POUNDS).	
	1916	1906
Total.....	2,542,626	3,716,765
Canned goods.....	2,640	1,110
Cement, brick, and lime.....	17,954	79,764
Coal.....	933,961	899,593
Cotton.....	2,903	1,413
Flour.....	11,119	15,867
Fruits and vegetables.....	80,426	499,340
Grain.....	70,243	71,029
Ice.....	18,871	36,612
Iron ore.....	166,405	369,576
Lumber.....	2,315	7,729
Naval stores.....	3,281	4,592
Petroleum and other oils.....	3,281	7,729
Phosphate and fertilizer.....	25,673	11,750
Pig iron and steel rails.....	903,640	924,351
Stone, sand, etc.....	304,983	785,578
Miscellaneous merchandise.....		

¹ Equals 112,199 M feet.

² Equals 226,752 M feet.

³ Equals 5,418 barrels.

⁴ Equals 2,630 barrels.

The total quantity of freight shipped in 1916 was less than the amount shipped in 1906 by 1,174,139 tons, or 31.6 per cent, due principally to the decrease in the amount of grain, lumber, and miscellaneous merchandise shipped—83.9 per cent for grain, 55 per cent for lumber, and 61.2 per cent for miscellaneous merchandise. Coal was the principal commodity shipped in 1916, constituting 36.7 per cent of all shipments reported, and stone, sand, etc., was second, with 35.5 per cent. In 1906, stone, sand, etc., was first, with 24.9 per cent of the total, and coal second, with 24.2 per cent.

Freight on inland waterways of New York.—The statistics in Tables 20, 21, and 22, for canals only, were taken from the Report of the Superintendent of Public Works of the State of New York, 1916. They do not include freight carried on the other inland waters of the state, as the census statistics do.

Table 20 shows the total number of tons of freight carried on the canals of New York state in 1916 and 1906.

TABLE 20.—CANALS OF NEW YORK—FREIGHT CARRIED, BY CANALS: ¹ 1916 AND 1906.

CANAL.	QUANTITY (TONS OF 2,000 POUNDS).	
	1916	1906
Total.....	1,625,050	3,540,907
Erie.....	917,689	2,385,491
Champlain.....	506,528	740,983
Oswego.....	135,948	172,228
Cayuga and Seneca.....	44,421	164,874
Black River.....	20,464	77,331

¹ From Report on Canals of the Superintendent of Public Works of the State of New York, 1916, pp. 356 and 360.

The decrease shown in the amount of freight carried on the canals in 1916 as compared with 1906 was 1,915,857 tons, or 54.1 per cent, the greater part of this loss—1,467,802 tons, or 76.6 per cent—being shown for the Erie Canal. In 1906 the traffic reported from this canal amounted to 67.4 per cent of the total, whereas in 1916 it amounted to only 56.5 per cent. The Champlain Canal, although showing an actual decrease from 1906 to 1916, increased its proportion from a little over one-fifth in 1906 to nearly one-third in 1916. The combined traffic for the three remaining canals represented 11.7 per cent of the total in 1906 and 12.4 per cent in 1916.

Table 21 shows the way and through freight, east and west bound, on canals of New York state, by commodities, for 1916.

Over three-fourths of the total traffic on the canals of New York was way freight, the leading commodities being stone, lime, and clay, lumber and timber, and coal. Lumber and timber and coal constituted the largest part of the through freight. Although not shown in this table, in 1906 total way freight amounted to 2,534,493 net tons, and the through freight amounted

to 1,006,414 net tons. In 1916 the way freight was 1,227,988 net tons, a decrease of 51.5 per cent, and the through freight 397,062 net tons, a decrease of 60.5 per cent.

TABLE 21.—CANALS OF NEW YORK—WAY AND THROUGH FREIGHT, CARRIED EAST AND WEST, BY COMMODITIES: 1916.¹

COMMODITY.	Aggregate (tons of 2,000 pounds).	WAY FREIGHT.			THROUGH FREIGHT.		
		Total (tons of 2,000 pounds).	East (tons of 2,000 pounds).	West (tons of 2,000 pounds).	Total (tons of 2,000 pounds).	East (tons of 2,000 pounds).	West (tons of 2,000 pounds).
Total.....	1,625,050	1,227,988	953,912	274,076	397,062	229,386	167,676
Barley malt.....	20,749	1,680	320	1,360	19,069	19,069	—
Coal.....	213,206	126,704	77,828	48,876	86,502	450	86,052
Grain.....	118,170	87,442	86,242	1,200	30,728	25,628	5,100
Ice.....	95,667	98,667	98,649	18	—	—	—
Iron ore.....	5,901	—	—	—	5,901	5,901	—
Lumber and timber.....	270,821	128,407	126,427	1,980	142,414	141,467	947
Pig iron and steel rails.....	22,177	120	—	120	22,057	22,057	—
Potatoes.....	2,139	2,139	2,139	—	—	—	—
Pulp wood.....	69,922	69,922	69,922	—	—	—	—
Salt, domestic.....	32,041	32,041	32,041	—	—	—	—
Stone, lime, and clay.....	642,911	588,515	414,224	174,291	54,396	102	54,294
Wood pulp.....	3,836	3,836	—	3,836	—	—	—
Miscellaneous merchandise.....	124,510	88,515	46,120	42,395	35,995	14,712	21,283

¹ From Report on Canals of the Superintendent of Public Works of the State of New York, 1916, pp. 246 to 260.

Table 22 shows, by commodities, the quantity of canal freight shipped down the Hudson River to New York City for 1916 and 1906.

TABLE 22.—CANALS OF NEW YORK—FREIGHT TO NEW YORK CITY, BY COMMODITIES: 1916 AND 1906.¹

COMMODITY.	QUANTITY (TONS OF 2,000 POUNDS.)	
	1916	1906
Total.....	385,149	953,202
Barley malt.....	19,462	(²)
Coal.....	25,692	230
Grain.....	82,425	290,513
Ice.....	5,902	93,072
Iron ore.....	153,071	29,643
Lumber and timber.....	21,423	231,165
Pig iron.....	1,614	12,942
Potatoes.....	27,972	(²)
Salt, domestic.....	26,375	(²)
Stone, lime, and clay.....	21,213	104,118
Miscellaneous merchandise.....	—	191,519

¹ From Reports on Canals of the Superintendent of Public Works of the State of New York, 1916, pp. 294 to 296; and 1906, pp. 280 to 284.

² Included in "Miscellaneous merchandise."

There were 385,149 tons of freight moved from canals down the Hudson River to New York City in 1916, a decrease of 568,053 tons, or 59.6 per cent, from that reported for 1906. In 1906 grain was the most important commodity shipped, ranking just ahead of lumber, but in 1916 it ranked fifth among the commodities shown in the table, decreasing 91.2 per cent. Lumber ranked first in 1916, although the quantity shipped in 1916 was less by 33.8 per cent than the quantity shipped in 1906.

Table 23 shows, by commodities, the freight carried by boats on the canals and other inland waters of New York state, the census totals being given and compared with the total from the New York state report, for 1916 and 1906.

Certain canal boats operated only a part of the year on canals and rivers above tidewater, their stay being longer, or the quantity of freight carried by them greater, in harbors or on rivers below tidewater. Statistics for these boats are, therefore, included in the

Atlantic coast and Gulf of Mexico division, from which the greater part of their activity was reported.

TABLE 23.—CANALS AND OTHER INLAND WATERS OF NEW YORK STATE—FREIGHT, BY COMMODITIES: 1916 AND 1906.

COMMODITY AND CENSUS YEAR.	CENSUS REPORT.			New York state report (tons of 2,000 pounds).
	Total (tons of 2,000 pounds).	Canals and all other inland waters of New York state (tons of 2,000 pounds).	Atlantic coast and Gulf of Mexico (tons of 2,000 pounds).	
Total:				
1916.....	1,307,984	1,120,762	187,222	1,625,050
1906.....	2,584,722	2,502,891	81,831	3,540,907
Canned goods:				
1916.....	1,890	1,890	—	(²)
1906.....	1,000	1,000	—	(²)
Cement, brick, and lime:				
1916.....	28,888	13,623	15,265	(²)
1906.....	89,739	77,464	12,275	(²)
Coal:				
1916.....	242,013	213,064	28,949	213,206
1906.....	472,657	453,709	18,948	545,941
Flour:				
1916.....	2,026	2,026	—	(²)
1906.....	277	277	—	300
Fruits and vegetables:				
1916.....	6,451	6,451	—	(²)
1906.....	15,546	15,546	—	(²)
Grain:				
1916.....	53,683	52,963	720	118,170
1906.....	472,953	466,977	5,976	554,291
Ice:				
1916.....	110,386	70,179	40,207	98,667
1906.....	90,118	68,059	22,059	116,508
Iron ore:				
1916.....	68,199	16,871	51,328	5,901
1906.....	37,867	36,612	1,255	31,446
Lumber:				
1916.....	196,219	160,382	35,837	270,821
1906.....	318,849	317,440	1,409	672,023
Naval stores:				
1916.....	2,215	2,215	—	(²)
1906.....	7,526	7,526	—	(²)
Petroleum and other oils:				
1916.....	378	378	—	(²)
1906.....	462	462	—	98
Phosphate and fertilizer:				
1916.....	759	759	—	(²)
1906.....	7,775	7,775	—	13,903
Pig iron and steel rails:				
1916.....	25,472	25,472	—	22,177
1906.....	12,414	11,370	1,044	15,517
Stone, sand, etc.:				
1916.....	341,836	330,568	11,268	642,911
1906.....	342,703	335,176	7,527	910,497
Miscellaneous merchandise:				
1916.....	227,569	223,921	3,648	253,197
1906.....	714,836	703,498	11,338	680,383

¹ In addition, there were 117,500 tons of cement carried on the Delaware and Hudson Canal, a waterway not owned by the state, the statistics for which were not included in the New York state report.

² Included in "Miscellaneous merchandise."

³ Included in "Stone, sand, etc."

Although the total tonnage reported by the Census Bureau is smaller than the total taken from the New York state report, most of the separate commodities compare favorably. The inconsistencies are attributed more to differences in statistical methods than to

errors or omissions by either the Census Bureau or the New York state officials.

Table 24 shows shipments and receipts, by commodities, for New York City, other Hudson River ports, and all other ports for 1916 and 1906.

TABLE 24.—HUDSON RIVER AND NEW YORK CITY—FREIGHT TO AND FROM NEW YORK CANALS, BY COMMODITIES: 1916 AND 1906.

COMMODITY.	Census year.	Aggregate traffic (tons of 2,000 pounds).	TOTAL (TONS OF 2,000 POUNDS).		NEW YORK CITY (TONS OF 2,000 POUNDS).		ALL OTHER HUDSON RIVER PORTS (TONS OF 2,000 POUNDS).		ALL OTHER PORTS (TONS OF 2,000 POUNDS).	
			Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.
Total.....	1916	846,120	429,474	416,646	286,586	159,310	46,200	72,562	96,688	184,774
	1906	2,046,145	1,070,881	975,264	834,706	425,309	21,657	18,534	214,518	531,421
Cement, brick, and lime.....	1916	19,124	9,562	9,562	6,450	458	900	2,029	2,212	7,075
	1906	72,642	54,816	17,826	50,878	9,791	440	3,790	3,498	4,245
Coal.....	1916	133,250	30,031	103,219	836	69,299	7,690	33,920	21,505	.....
	1906	500,592	196,719	303,873	39,514	120,198	7,876	9,241	149,329	174,434
Fruits and vegetables.....	1916	1,883	1,046	837	1,046	.....	.....	.....	.....	837
	1906	7,468	7,284	184	7,284	75	.....	.....	.....	109
Grain.....	1916	85,054	42,527	42,527	40,422	2,105	.....	.....	2,105	40,422
	1906	364,652	362,681	1,971	360,739	1,191	1,440	.....	502	780
Ice.....	1916	119,258	59,629	59,629	58,129	.....	1,500	8,575	.....	51,054
	1906	29,849	26,999	2,850	26,199	.....	800	2,850	.....	.....
Iron ore.....	1916	5,418	2,709	2,709	1,194	.....	1,515	1,075	.....	1,634
	1906	18,803	17,778	1,025	846	.....	200	.....	16,732	1,025
Lumber.....	1916	141,524	124,832	16,692	115,727	580	9,105	691	.....	15,421
	1906	325,390	205,956	119,434	200,369	8,757	3,225	492	2,362	110,185
Naval stores.....	1916	3,533	1,318	2,215	.....	2,215	297	.....	1,021	.....
	1906	9,138	1,612	7,526	.....	7,497	.....	.....	1,612	29
Phosphate and fertilizer.....	1916	400	200	200	.....	200	.....	.....	200	.....
	1906	7,615	2,283	5,332	154	5,178	.....	.....	2,129	154
Pig iron and steel rails.....	1916	49,544	25,105	24,439	19,564	.....	5,541	.....	.....	24,439
	1906	8,820	6,791	2,029	5,931	1,054	.....	.....	860	975
Stone, sand, etc.....	1916	109,631	48,384	61,247	4,022	39,246	4,580	16,179	39,782	5,822
	1906	121,656	60,735	60,921	29,310	56,519	2,270	1,463	29,155	2,939
Miscellaneous merchandise.....	1916	177,501	84,131	93,370	39,196	45,207	15,072	10,093	29,863	38,070
	1906	579,520	127,227	452,293	113,482	215,049	5,406	698	8,339	236,546

In 1916 the total freight traffic on the Hudson River to and from New York canals, which is also included in the statistics for canals and other inland waters of New York state, amounted to 846,120 tons, a decrease of 1,200,025 tons, or 58.6 per cent, from the tonnage in 1906.

Lumber, coal, and ice were the leading commodities reported, most of the lumber and ice being received at New York City. Lumber was eastbound freight, and coal, naval stores, and stone, sand, etc., were eastern products shipped west.

Table 25 shows the freight carried on the Hudson River, whether shipped or received. The figures represent not only the quantity shown in Table 24, but include that in the division of Atlantic coast and Gulf of Mexico as carried to and from the canals of New York and to and from Hudson River ports.

In 1916 as in 1906 the traffic up and down the Hudson River was heaviest at river ports where the freight was either received or delivered at the ports

of the Atlantic coast and Gulf of Mexico. The next heaviest traffic, both shipments and receipts for each census, was at canal ports of the state of New York. For both of these sources of freight there was a decrease as compared with 1906, the net decrease in the total being 2,189,802 tons, or 25.3 per cent.

TABLE 25.—HUDSON RIVER TRAFFIC: 1916 AND 1906.

SOURCE.	TONS OF 2,000 POUNDS.	
	1916	1906
Total.....	6,465,078	8,654,880
To and from New York canals (included in Canals and other inland waters of New York state).....	846,120	2,046,145
To and from New York canals (included in Atlantic coast and Gulf of Mexico).....	187,222	81,831
To and from river ports (included in Atlantic coast and Gulf of Mexico).....	5,431,736	6,526,904

Table 26 shows the receipts and shipments of freight by commodities, for the Hudson River, for 1916 and 1906.

TABLE 26.—HUDSON RIVER RECEIPTS AND SHIPMENTS OF FREIGHT, BY COMMODITIES: 1916 AND 1906.

COMMODITY AND CENSUS YEAR.	Total (tons of 2,000 pounds).	Received from river, canal, and outside ports (tons of 2,000 pounds).	Shipped to all canals and outside ports (tons of 2,000 pounds).	COMMODITY AND CENSUS YEAR.	Total (tons of 2,000 pounds).	Received from river, canal, and outside ports (tons of 2,000 pounds).	Shipped to all canals and outside ports (tons of 2,000 pounds).
Total:				Iron ore:			
1916.....	6,465,078	1,291,689	5,173,389	1916.....	111,017	2,712	108,305
1906.....	8,664,880	1,751,255	6,903,625	1906.....	21,134	17,778	3,356
Canned goods:				Lumber:			
1916.....	10,395	9,465	930	1916.....	198,666	132,099	66,567
1906.....	16,322	8,755	7,567	1906.....	571,437	211,876	359,561
Cement, brick, and lime:				Naval stores:			
1916.....	1,433,748	38,579	1,395,169	1916.....	5,043	2,818	2,225
1906.....	2,039,452	103,606	1,935,846	1906.....	9,138	1,612	7,526
Coal:				Petroleum and other oils:			
1916.....	817,110	272,725	544,385	1916.....	138,381	138,200	181
1906.....	1,079,712	417,732	661,980	1906.....	519	424	95
Flour:				Phosphate and fertilizer:			
1916.....	1,914	1,126	788	1916.....	1,759	1,437	322
1906.....	7,657	6,926	731	1906.....	8,907	3,575	5,332
Fruits and vegetables:				Pig iron and steel rails:			
1916.....	34,221	13,514	20,707	1916.....	56,958	25,110	31,848
1906.....	31,029	14,212	16,817	1906.....	28,429	14,950	13,479
Grain:				Stone, sand, etc.:			
1916.....	86,602	42,840	43,762	1916.....	2,025,381	251,510	1,773,871
1906.....	370,861	362,681	8,180	1906.....	1,836,481	107,488	1,728,993
Ice:				Miscellaneous merchandise:			
1916.....	912,622	62,419	850,203	1916.....	631,261	297,135	334,126
1906.....	1,298,124	28,199	1,269,925	1906.....	1,335,678	451,441	884,237

Traffic with Canada.—A considerable amount of freight came into New York from Canada and left the state for Canada, via Lake Champlain, Richelieu River, and the Sorel Canal. This traffic was carried on wholly in unrigged boats and there was little diversity in the character of cargoes carried. The incoming tonnage of 178,453 exceeded the exports by 35,573 net tons. The imports consisted of 115,228 tons of lumber, 666 tons of pig iron, 209 tons of fruit, and 62,050 tons of miscellaneous freight. The principal

exports were 97,717 tons of coal, 14,162 tons of iron ore, 14,944 tons of stone, 707 tons of naval stores, and 15,350 tons of miscellaneous freight. Three hundred tons, or 150 M feet, of lumber shipped into the United States from Canada over the same water-courses was delivered in Vermont.

Freight on inland waterways of states other than New York.—Table 27 shows, by states and geographic divisions, the freight traffic on the canals and other inland waters of states, exclusive of New York, for 1916.

TABLE 27.—FREIGHT CARRIED ON CANALS AND OTHER INLAND WATERS OF STATES, EXCLUSIVE OF NEW YORK, BY COMMODITIES AND BY DIVISIONS AND STATES: 1916.

DIVISION AND STATE.	Total freight (tons). ¹	Canned goods (tons).	Ce- ment, brick, and lime (tons).	Coal (tons).	Cot- ton (tons).	Flour (tons).	Fruits and vege- tables (tons).	Grain (tons).	Ice (tons).	Lumber.		Naval stores (tons).	Petroleum and other oils.		Phos- phate and fer- tilizer (tons).	Pig iron and steel rails (tons).	Stone, sand, etc. (tons).	To- bacco (tons).	Mis- cella- neous merch- andise (tons).
										Tons.	M. feet.		Tons.	Bbls.					
United States.....	1,421,864	750	3,431	720,597	40	877	4,668	27,463	64	6,023	3,242	100	694	3,321	2,522	201	573,072	5	81,057
North Atlantic divi- sion.....	638,606	196	31	447,346	.....	127	75	531	5	1,801	939	100	59	295	140	75	154,006	5	34,109
Maine.....	18,282	196	31	531	.....	127	75	531	5	524	262	100	2	10	100	75	50	5	15,430
New Hampshire.....	802	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	802
Vermont.....	17,800	.....	.....	1,420	.....	.....	.....	.....	.....	1,239	657	.....	.....	.....	.....	.....	.....	.....	14,041
New Jersey.....	152,880	.....	.....	120,110	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32,770	.....	.....
Pennsylvania.....	448,842	.....	.....	325,285	.....	.....	.....	.....	.....	38	20	.....	57	285	40	.....	120,086	.....	3,336
South Atlantic divi- sion.....	190,239	.....	400	177,002	.....	8	.....	725	.....	.....	.....	.....	.....	.....	2,382	.....	5,380	.....	4,342
Maryland.....	181,759	.....	.....	177,002	.....	8	.....	725	.....	.....	.....	.....	.....	.....	703	.....	380	.....	2,942
Virginia.....	1,380	.....	400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	980	.....	.....	.....	.....
Georgia.....	7,100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	700	.....	5,000	.....	1,400
North Central division	490,608	67	2,567	96,470	.....	98	3,268	13,881	.....	1,459	740	.....	193	1,058	.....	13	350,569	.....	22,023
Ohio.....	35,165	.....	.....	.....	.....	.....	.....	1,500	.....	120	60	.....	.....	.....	.....	.....	21,165	.....	14,000
Illinois.....	261,574	.....	20	50	.....	.....	.....	1,237	.....	450	224	.....	.....	.....	.....	.....	259,882	.....	2
Wisconsin.....	170,225	.....	2,496	88,480	.....	28	3,215	11,144	.....	889	456	.....	159	908	.....	13	69,047	.....	5,256
Minnesota.....	16,056	67	51	440	.....	70	50	.....	.....	.....	.....	.....	34	150	.....	.....	475	.....	2,711
Missouri.....	7,588	.....	.....	7,500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	54
South Central division	1,487	10	10	60	40	2	.....	40	55	133	67	.....	.....	.....	.....	.....	5	.....	1,132
Louisiana.....	640	.....	10	.....	.....	.....	.....	40	55	133	67	.....	.....	.....	.....	.....	5	.....	437
Arkansas.....	847	10	.....	60	40	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	695
Western division.....	100,924	477	423	19	.....	642	1,325	12,286	4	2,630	1,496	.....	442	1,968	.....	113	63,112	.....	19,451
Montana.....	21,077	.....	240	.....	.....	60	174	11,123	.....	1,415	725	.....	2	10	.....	.....	.....	.....	8,063
Idaho.....	73,560	358	152	7	.....	489	685	967	2	662	375	.....	354	1,569	.....	113	63,112	.....	6,659
Arizona.....	335	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	335
Washington.....	3,839	115	12	12	.....	73	388	83	2	260	165	.....	52	235	.....	.....	.....	.....	2,842
Oregon.....	1,191	4	19	.....	.....	20	12	113	.....	26	14	.....	20	90	.....	.....	.....	.....	977
California.....	922	.....	.....	.....	.....	66	.....	.....	.....	267	217	.....	14	64	.....	.....	.....	.....	575

¹ All tons of 2,000 pounds.

The North Atlantic division exceeded all others in total quantity of freight carried on canals and other inland waters, having 638,606 tons, or 44.9 per cent of the total, and the North Central division was second, with a tonnage of 490,608, or 34.5 per cent. The leading state in total freight traffic was Pennsylvania, with 448,842 tons, or 31.6 per cent of the total, Illinois ranking second, with 261,574 tons, or 18.4 per cent.

The information following is shown by states, arranged according to the order in which they are presented in Table 27.

Maine.—The freight reported as carried on inland waterways of this state was of a heterogeneous character. It was carried between ports on five lakes of the state, of which Moosehead was most important.

FREIGHT ON LAKES OF MAINE: 1916.

LAKE.	Quantity (tons of 2,000 pounds).
Total.....	18,282
Moosehead.....	10,643
North Twin and South Twin.....	1,363
Rangely.....	1,371
Schago.....	4,905

New Hampshire.—All freight reported for this state was carried on Lakes Sunapee and Winnepesaukee, and was of a miscellaneous class. For Lake Winnepesaukee, 517 tons were reported and for Lake Sunapee 285 tons.

Vermont.—Lake Champlain is the only body of water in this state for which freight was reported. The Bureau of the Census has classified the shipments in such a manner as to give full credit for transactions originating on the Vermont side of the lake to the state of Vermont, and those originating on the New York side to the state of New York. Figures for New York state traffic may be found in that part of the report which deals specifically with the inland waters of New York state. Commodities amounting to 17,800 tons were shipped, of which coal constituted 1,420 tons, lumber 1,239 tons, and stone 1,100 tons. The remainder was of a miscellaneous character. In addition, 1,100 tons of freight were lightered on the Vermont side of Lake Champlain.

New Jersey.—The freight reported by this state was carried on canals exclusively. Of the total, 120,110 tons were coal and 32,770 tons sand and stone. The relative importance of the two canals may be judged from the accompanying statement.

FREIGHT ON CANALS OF NEW JERSEY: 1916.

CANAL.	Quantity (tons of 2,000 pounds).
Total.....	152,880
Delaware and Raritan.....	151,180
Morris.....	1,700

Pennsylvania.—The census returns for inland water transportations of this state included freight carried on the Lehigh Coal and Navigation Co.'s canals, and on the Susquehanna, Lehigh, and Schuylkill Rivers. A very large quantity of freight reported for the Delaware River, whose principal port is Philadelphia, and for the Allegheny, Monongahela, and Ohio Rivers, whose chief port is Pittsburgh, is credited to the Atlantic coast and the Mississippi River divisions and not to that of Canals and other inland waters.

FREIGHT ON WATERWAYS OF PENNSYLVANIA: 1916.

WATERWAY.	Quantity (tons of 2,000 pounds).
Total.....	448,842
Lehigh Coal and Navigation Co. canals.....	171,276
Susquehanna River.....	125,057
Lehigh River.....	121,205
Schuylkill River.....	31,304

Coal was the chief commodity transported over these waterways, aggregating 325,285 tons. The smallest quantity, 16,461 tons, was carried on the Susquehanna River. Lightering was extensive on inland waterways of this state, the tonnage amounting to 120,659.

Maryland.—Canal traffic in 1916 was limited largely to the shipment of coal over the Chesapeake and Ohio Canal, which has terminals at Washington, D. C., and Cumberland, Md. A small quantity of miscellaneous freight was carried from Washington to various points en route.

Virginia.—Inland water traffic was incident to the operation of the Chesapeake and Ohio Canal, a considerable quantity of phosphate being shipped from Alexandria, Va., to farmers along the canal in Maryland. Shipments from Alexandria, Va., over the Potomac River are credited to the Atlantic coast traffic.

Georgia.—Returns from this state were confined to the two rivers Oostanaula and Coosa, on which 7,100 tons were carried. The greater portion, 5,000 tons, was stone and sand, but 700 tons were phosphates.

Ohio.—The principal shipments reported for Ohio were carried over the Miami and Erie Canal and the Sandusky River. Sand and stone, amounting to 21,165 tons, were the most important commodities. Thirty-two thousand tons of sand were lightered on the Maumee River.

Illinois.—The freight reported for this state was carried on three canals—Illinois and Mississippi, Chicago Drainage and Ship, and the Illinois and Michigan.

FREIGHT ON CANALS OF ILLINOIS: 1916.

CANAL.	Quantity (tons of 2,000 pounds).
Total.....	261,574
Chicago Drainage and Ship.....	258,657
Illinois and Michigan.....	217
Illinois and Mississippi.....	2,700

Stone and sand were the principal commodities, aggregating 258,657 tons, all carried on the Chicago Drainage and Ship Canal. Grain was the chief commodity carried on the Illinois and Mississippi Canal, amounting to 1,500 tons.

Wisconsin.—The largest quantity of freight carried on the inland waters of this state was 166,195 tons, reported for Winnebago Lake, of which coal and stone were the principal commodities, 88,480 tons of the former and 69,047 tons of the latter being reported. Freight was also reported for Buffalo Lake and for Paygan Lake, and for the Fox and Wolf Rivers. Shipments were heavier on the lakes than on the rivers.

FREIGHT ON WATERWAYS OF WISCONSIN: 1916.

LAKE AND RIVER.	Quantity (tons of 2,000 pounds).
Total.....	170,225
Buffalo Lake.....	53
Fox River.....	712
Paygan Lake.....	3,225
Winnebago Lake.....	166,195
Wolf River.....	40

Minnesota.—Reports were received for traffic on seven of the lakes of Minnesota and on Rainy River. The three lakes reporting the heaviest shipments were Big Stone Lake, with 8,404 tons of freight, mostly grain; Lake Traverse, with 4,065 tons of grain, lumber, and stone; and Vermillion Lake, with 825 tons of miscellaneous freight. Various kinds of freight were shipped over Rainy River.

FREIGHT ON WATERWAYS OF MINNESOTA: 1916.

LAKE AND RIVER.	Quantity (tons of 2,000 pounds).
Total.....	16,056
Big Stone Lake.....	8,404
Leech Lake.....	200
Minnetonka Lake.....	400
Rainy Lake.....	615
Red Lake.....	250
Traverse Lake.....	4,065
Vermillion Lake.....	825
Rainy River.....	1,297

Missouri.—The only inland waterway in Missouri on which traffic was reported separately from the traffic on the Mississippi and its tributaries was the Little River. The total freight reported for that river was 7,588 tons, which was mostly coal.

Louisiana.—A small quantity of freight, 640 tons, was reported from this state. It was mostly miscellaneous supplies shipped to the various oil mines located on the shores of Lake Caddo.

Arkansas.—The freight reported from this state was carried on the Little River, a tributary of the Red

River, and on two small lakes. Coal, cotton, and grain were the principal commodities reported, but there were also 695 tons of miscellaneous merchandise carried.

Montana.—Grain was the chief commodity carried on the inland waterways of this state, 11,074 tons being reported from Flathead Lake. Lumber was the next most important commodity. Some lighter-age was also reported.

FREIGHT ON LAKES IN MONTANA: 1916.

LAKE.	Quantity (tons of 2,000 pounds).
Total.....	21,077
Flathead.....	20,254
McDonald.....	156
Swan.....	667

Idaho.—The freight reported as carried on the inland waterways of Idaho is shown for boats operating on two lakes and two rivers. There was 64,771 tons, all stone and sand, reported for Pend Oreille Lake.

FREIGHT ON WATERWAYS OF IDAHO: 1916.

LAKE AND RIVER.	Quantity (tons of 2,000 pounds).
Total.....	73,560
Coeur d'Alene Lake.....	7,804
Kootenai River.....	454
Pend Oreille Lake.....	64,771
Snake River.....	531

Arizona.—The Colorado River was the only water-course reporting freight for this state, with a tonnage of 335, all miscellaneous merchandise.

Washington.—Reports were received for traffic carried on Lakes Chelan and Whatcom and Clark Fork River, and a small quantity on Columbia River, the total traffic amounting to 3,839 tons, mostly of a miscellaneous nature.

Oregon.—Klamath Lake, the most important body of water from which freight was reported, showed 1,062 tons, mostly miscellaneous merchandise. A small quantity was carried on Goose Lake, and also on the Columbia River, where the shipments were from bank to bank in Washington and Oregon.

California.—Lumber was the principal commodity reported for Lake Tahoe. A miscellaneous class of freight was carried to the Nevada side.

PASSENGERS.

Table 28 shows, for New York state and all other states, the number of regular and excursion passengers carried on steam vessels for 1916 and 1906.

TABLE 28.—CANALS AND OTHER INLAND WATERS OF NEW YORK STATE AND ALL OTHER STATES—PASSENGERS ON STEAM VESSELS, BY STATES: 1916 AND 1906.

STATE AND CENSUS YEAR.	Total.	Regular.	Excursion.
Total:			
1916.....	1,994,236	1,415,549	578,687
1906.....	1,871,769	1,359,648	512,121
New York: ¹			
1916.....	622,815	565,895	56,920
1906.....	828,932	580,246	248,686
All other states:			
1916.....	1,371,421	849,654	521,767
1906.....	1,042,837	779,402	263,435
California—			
1916.....	8,852	8,852	.....
1906.....	1,200	1,200	.....
Idaho—			
1916.....	111,842	110,616	1,226
1906.....	500	500	.....
Iowa—			
1916.....	21,000	18,000	3,000
1906.....	.....	.....	.....
Maine—			
1916.....	97,840	83,040	14,800
1906.....	.....	.....	.....
Massachusetts—			
1916.....	46,450	28,450	18,000
1906.....	35,000	35,000	.....
Michigan—			
1916.....	98,150	10,800	87,350
1906.....	96,601	16,301	80,300
Minnesota—			
1916.....	288,654	273,222	15,432
1906.....	784,648	631,236	153,412
Montana—			
1916.....	35,008	32,858	2,150
1906.....	3,287	2,419	868
New Hampshire—			
1916.....	70,261	59,361	10,900
1906.....	.....	.....	.....
Ohio—			
1916.....	31,760	5,760	26,000
1906.....	.....	.....	.....
Oregon—			
1916.....	74,204	73,714	490
1906.....	8,119	6,119	2,000
Pennsylvania—			
1916.....	232,974	20,876	212,098
1906.....	.....	.....	.....
Vermont: ²			
1916.....	10,136	10,136	.....
1906.....	.....	.....	.....
Washington—			
1916.....	24,019	22,607	1,412
1906.....	30,067	28,440	1,627
Wisconsin—			
1916.....	220,271	91,362	128,909
1906.....	70,780	48,352	22,428
Illinois—			
1916.....	800	.....	800
1906.....	.....	.....	.....
North Dakota—			
1916.....	1,835	1,835	.....
1906.....	.....	.....	.....
West Virginia—			
1916.....	10,000	8,000	2,000
1906.....	.....	.....	.....

¹ Includes 172,818 regular passengers and 646 excursion passengers from Vermont side of Lake Champlain.

² Passengers carried on Lake Champlain not included.

There were 1,994,236 regular and excursion passengers reported as carried by steam vessels on the canals and other inland waterways of the United States in 1916, an increase of 122,467, or 6.5 per cent, over the number reported for 1906. In 1916 New York passengers represented 31.2 per cent of the total, as compared with 44.3 per cent in 1906. The greatest gain for the decade was in the number of excursion passengers, 66,566, or 13 per cent. These passengers in 1906 represented 27.4 per cent of the total and 29 per cent in 1916. While only 13 states reported passengers on inland waterways in 1906, 16 states reported them in 1916. Three of the states, Illinois, North Dakota, and West Virginia, included in the 1906 census, made no report of passengers carried in 1916, but 6 new states were added, Iowa, Maine, New Hampshire, Ohio, Pennsylvania, and Vermont, with a combined traffic of 463,971 passengers.

Very marked increases are shown for Wisconsin and Idaho, mostly in regular passengers. Three states, New York, Minnesota, and Washington, show a decrease in total number carried, involving a decrease in both regular and excursion. Massachusetts and Michigan show a decrease in regular passengers only, and Oregon a decrease in excursion passengers. The decrease was most marked in Minnesota, 495,994, or 63.2 per cent, in the total number, and 137,980, or 89.9 per cent, in excursion passengers. New York was second in absolute decrease in the total number, 206,117, or 24.9 per cent, with a decrease of 191,766, or 77.1 per cent, in excursion passengers.

Notwithstanding New York showed such a heavy decrease, the state led in 1916 in the total number and in the number of regular passengers, in which latter particular it displaced Minnesota. It yielded leadership to Pennsylvania, however, in number of inland waterway excursionists, also being exceeded by Wisconsin and Michigan in this particular.

In 1916 the regular passengers exceeded in number the excursion passengers in 11 of the states that reported both classes of passengers. Michigan, Ohio, Pennsylvania, and Wisconsin showed greater numbers in the excursion class. Of these 4 states Pennsylvania reported an unusually heavy traffic in excursionists. More than one-third of these were carried from Bristol, Pa., to Burlington, N. J., and the remaining two-thirds were distributed among Lakes Conneaut and Harvey and the Schuylkill River.

Wisconsin, which is next in importance to Pennsylvania in excursion traffic, differs from it in that there are more tourists and excursionists from distant points. One-half of the volume of this short seasonal business was on Lake Mendota, Lake Winnebago, and Fox River.

Table 29 gives a detailed statement of passenger traffic for New York state for 1916.

TABLE 29.—CANALS AND OTHER INLAND WATERS OF NEW YORK STATE—REGULAR AND EXCURSION PASSENGERS ON STEAM VESSELS, BY CANALS AND LAKES: 1916.

CANAL AND LAKE.	Total.	Regular.	Excursion.
Total.....	¹ 622,815	565,895	56,920
On canals.....	8,600	8,100	500
Champlain Canal.....	8,500	8,000	500
Erie Canal.....	100	100	.....
On lakes.....	614,215	557,795	56,420
Lake Canandaigua.....	17,900	17,900	.....
Lake Cayuga.....	6,350	900	5,450
Lake Champlain.....	¹ 239,966	239,320	646
Lake Chautauqua.....	194,056	146,344	47,712
Lake George.....	112,477	112,277	200
Lake Raquette.....	12,258	12,258	.....
All other lakes.....	31,208	28,796	2,412

¹ Includes 172,818 regular and 646 excursion passengers credited to Vermont.

The number of passengers carried on the canals of New York was insignificant, representing only 1.4 per cent of the total. Lake Champlain led in regular passengers, and Lake Chautauqua, which was the greatest center of the state for inland excursionists, was second.

CONGRESSIONAL APPROPRIATIONS.

Appropriations by Congress made for improvements on Lake Champlain, by localities, are shown in the following statement:

CONGRESSIONAL APPROPRIATIONS FOR THE SURVEY, IMPROVEMENT, AND MAINTENANCE OF THE HARBORS AND TRIBUTARY STREAMS OF LAKE CHAMPLAIN, BY PERIODS AND LOCALITIES.

LOCALITY.	Date of earliest appropriation.	APPROPRIATIONS.			
		Total.	Up to and including 1890.	1891 to 1906, inclusive.	1907 to 1916, inclusive.
Total.....	1836	\$1,537,765	\$1,133,660	\$211,750	\$192,355
New York.....	1836	399,180	328,680	28,000	42,500
Great Chazy River.....	1890	18,000	10,000	8,000	.....
Plattsburg Harbor.....	1836	233,180	185,680	5,000	42,500
Rouse Point Breakwater.....	1884	98,500	83,500	15,000	.....
Ticonderoga River.....	1881	16,500	16,500	.....	.....
Whitehall Harbor.....	1836	33,000	33,000	.....	.....
Vermont.....	1836	1,138,585	804,980	183,750	149,855
Burlington Harbor.....	1836	832,335	582,230	117,750	132,355
Gordons Landing Harbor.....	1886	34,750	34,750	.....	.....
Lake Champlain Narrows.....	1836	¹ 138,500	76,000	45,000	17,500
Otter Creek.....	1872	62,500	41,500	21,000	.....
Swanton Harbor.....	1873	70,500	70,500	.....	.....

¹ Includes \$31,000 appropriated for deepening the channel near St. Albans, called the "Cut."

During the 10 years ending with the close of 1916 the amounts appropriated for survey, maintenance, and improvement of Lake Champlain and its tributaries was devoted, for the most part, to the needs of the harbors at Burlington, Vt., and Plattsburg, N. Y. Most of the appropriations since 1836 have been expended for work on the Vermont side of the lake.

Various appropriations from period to period for the Red River (of the North), which separates Minnesota from South Dakota, and also for Warroad Harbor and River in Minnesota are given in the following statement:

CONGRESSIONAL APPROPRIATIONS FOR THE SURVEY, IMPROVEMENT, AND MAINTENANCE OF RED RIVER (OF THE NORTH) AND WARROAD HARBOR AND RIVER.

	Date of earliest appropriation.	APPROPRIATIONS.			
		Total.	Up to and including 1890.	1891 to 1906, inclusive.	1907 to 1916, inclusive.
Total.....	1876	\$498,523	\$218,000	\$188,623	\$91,900
Red River (of the North).....	1876	378,623	218,000	¹ 105,623	55,000
Warroad Harbor and River.....	1899	119,900	.....	83,000	36,900

¹ Includes appropriations for survey of Ottetail Lake and River, and Red Lake and Red Lake River.

The bulk of the appropriation has always been devoted to the improvement of the Red River (of the North). The appropriations for this river since 1876, including those made during the last 10 years, amounted to over three-fourths of the total shown in the statement.

Table 30 shows in detail, for all vessels, the principal statistics of transportation on the canals and other inland waters of the United States, by class, occupation, and ownership, for 1916.

TRANSPORTATION BY WATER.

TABLE 30.—ALL VESSELS, BY CLASS.

CLASS, OCCUPATION, AND OWNERSHIP.		Number of vessels.	TONNAGE.		RIGGED.			HORSEPOWER OF ENGINES.		CONSTRUCTION.		
			Gross	Net.	Screw.	Slide wheel.	Stern wheel.	Steam.	Gasoline.	Metal.	Wood.	Composite.
1	AGGREGATE.....	2,052	196,462	176,210	467	14	96	35,100	7,980	44	1,995	13
2	STEAM.....	340	23,907	15,500	266	12	62	35,100		30	299	11
3	Freight and passenger.....	163	17,068	10,978	139	6	18	22,104		15	138	10
4	Tugs and other towing vessels.....	138	5,762	3,766	106	5	27	10,933		13	124	1
5	Ferryboats.....	6	278	226	2	1	3	214		1	5	
6	Yachts.....	19	454	316	17		2	1,661		1	18	
7	Miscellaneous.....	14	345	214	2		12	248			14	
8	Individual.....	116	5,697	4,241	83		33	8,404		9	107	
9	Freight and passenger.....	50	3,547	2,709	41		9	2,797		1	49	
10	Tugs and other towing vessels.....	41	1,404	1,064	26		15	3,805		7	34	
11	Ferryboats.....	2	74	57	1		1	60			2	
12	Yachts.....	17	432	301	15		2	1,619		1	16	
13	Miscellaneous.....	6	180	110			6	123			6	
14	Firm.....	28	865	616	15		13	952			28	
15	Freight and passenger.....	6	415	301	4		2	360			6	
16	Tugs and other towing vessels.....	14	308	234	9		5	475			14	
17	Ferryboats.....											
18	Yachts.....	2	22	15	2			42			2	
19	Miscellaneous.....	6	120	66			6	75			6	
20	Incorporated company.....	178	16,785	10,253	151	11	16	24,952		20	147	11
21	Freight and passenger.....	107	13,106	7,968	94	6	7	18,947		14	83	10
22	Tugs and other towing vessels.....	68	3,495	2,131	56	5	7	5,881		5	62	1
23	Ferryboats.....	3	184	154	1		2	124		1	2	
24	Yachts.....											
25	Miscellaneous.....											
26	All other.....	18	560	390	17	1		852		1	17	
27	Freight and passenger.....											
28	Tugs and other towing vessels.....	15	495	337	15			772		1	14	
29	Ferryboats.....	1	20	15		1		30			1	
30	Yachts.....											
31	Miscellaneous.....	2	45	38	2			50			2	
32	MOTOR.....	237	3,985	2,989	201	2	34		7,980	7	228	2
33	Freight and passenger.....	97	1,878	1,422	79		18	3,696		5	92	
34	Tugs and other towing vessels.....	16	196	157	15		1	553			16	
35	Ferryboats.....	11	225	182	6	2	3	372			11	
36	Yachts.....	102	1,430	1,025	93		9	2,957		1	99	2
37	Miscellaneous.....	11	256	193	8		3	402		1	10	
38	Individual.....	163	2,254	1,709	143	2	18	4,672		1	160	2
39	Freight and passenger.....	52	622	515	41		11	1,242			52	
40	Tugs and other towing vessels.....	9	132	99	8		1	369			9	
41	Ferryboats.....	8	161	122	5	2	1	305			8	
42	Yachts.....	91	1,303	944	86		5	2,701		1	88	2
43	Miscellaneous.....	3	36	29	3			55			3	
44	Firm.....	32	431	310	23		9	1,097		1	31	
45	Freight and passenger.....	18	279	192	14		4	796			18	
46	Tugs and other towing vessels.....	2	20	16	2			60			2	
47	Ferryboats.....	2	27	23	1		1	45			2	
48	Yachts.....	7	53	39	5			141			7	
49	Miscellaneous.....	3	52	40	1		2	55		1	2	
50	Incorporated company.....	36	1,095	809	31		5	1,897		5	31	
51	Freight and passenger.....	27	977	715	24		3	1,658		5	22	
52	Tugs and other towing vessels.....	5	44	42	5			124			5	
53	Ferryboats.....											
54	Yachts.....	4	74	52	2		2	115			4	
55	Miscellaneous.....											
56	All other.....	6	205	161	4		2	314			6	
57	Freight and passenger.....											
58	Tugs and other towing vessels.....											
59	Ferryboats.....	1	37	37			1	22			1	
60	Yachts.....											
61	All other.....	5	108	124	4		1	292			5	
62	SAIL.....	5	258	241							5	
63	Freight and passenger.....	2	138	126							2	
64	Yachts.....	3	120	115							3	
65	Miscellaneous.....											
66	Individual.....	5	258	241							5	
67	Freight and passenger.....	2	138	126							2	
68	Yachts.....	3	120	115							3	
69	Miscellaneous.....											
70	UNRIGGED.....	1,470	168,312	157,480						7	1,463	
71	Canal boats.....	1,056	134,390	125,170							1,056	
72	All other unrigged.....	414	33,922	32,310						7	407	
73	Individual.....	639	79,821	75,189						3	636	
74	Canal boats.....	582	77,380	72,808							582	
75	All other unrigged.....	57	2,441	2,321						3	54	
76	Firm.....	157	10,418	10,095							157	
77	Canal boats.....	76	5,955	5,796							76	
78	All other unrigged.....	81	4,433	4,299							81	
79	Incorporated company.....	598	73,689	68,204						4	594	
80	Canal boats.....	338	51,025	46,506							338	
81	All other unrigged.....	200	22,664	21,698						4	196	
82	All other.....	76	4,384	3,992							76	
83	Canal boats.....											
84	All other unrigged.....	76	4,384	3,992							76	

CANALS AND OTHER INLAND WATERS.

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OCCUPATION, AND OWNERSHIP: 1916.

Value of vessels.	INCOME.				Number employed on vessels.	Wages.	NUMBER OF PASSENGERS CARRIED.		FREIGHT CARRIED (TONS OF 2,000 POUNDS).		
	Total.	Freight.	Passengers.	All other.			Regular.	Excursion.	Exclusive of lighterage.	Lighterage or harbor work.	
\$5,748,086	\$4,192,323	\$2,004,189	\$625,092	\$1,560,042	3,174	\$1,268,895	1,426,349	578,687	2,542,626	516,853	1
2,752,683	1,353,272	256,288	533,235	563,746	1,291	518,139	1,211,743	435,046	185,844	2,250	2
1971,708	837,292	220,560	522,367	94,365	782	271,013	1,184,897	353,802	156,651	2,250	3
646,025	477,102	27,891	449,211	448	448	219,965			29,147		4
34,850	21,767	7,837	10,871	3,059	10	6,857	26,846	81,244	46		5
85,100					25	10,885					6
15,000	17,111			17,111	26	9,419					7
410,450	218,584	56,899	23,384	138,301	285	112,882	33,534	111,745	58,400		8
160,550	92,211	56,713	22,134	13,364	140	49,505	27,564	111,609	58,354		9
152,500	110,061			110,061	99	43,369					10
6,500	3,316	186	1,250	1,880	3	1,757	5,970	136	46		11
82,100					25	10,885					12
8,800	12,996			12,996	18	7,366					13
57,650	60,500	16,491	4,815	39,194	68	27,680	12,119	5,273	23,710		14
24,000	22,087	16,491	4,815	751	27	9,729	12,119	5,273	23,710		15
26,900	35,213			35,213	34	16,048					16
3,000											17
3,750	3,200			3,200	7	1,303					18
2,214,525	1,029,004	132,898	505,039	341,067	879	349,195	1,166,090	316,828	103,734	2,950	20
1,787,158	722,994	147,356	495,418	80,220	615	211,779	1,145,214	236,920	74,587	2,950	21
400,017	287,559	27,891	259,665	258	258	132,916			29,147		22
27,350	18,451	7,651	9,621	1,179	6	4,500	20,876	79,908			23
											24
											25
70,058	45,184			45,184	59	28,382		1,200			26
66,608	44,269			44,269	57	27,032					27
1,000					1	600		1,200			28
2,450	915			915	1	750					29
											30
608,603	213,068	39,148	93,973	79,947	226	75,461	203,806	143,641	11,225		31
											32
249,219	136,483	38,123	84,458	13,902	123	37,236	141,683	143,429	10,880		33
35,665	20,844			20,844	20	8,277					34
29,900	36,412	1,000	9,420	25,982	14	6,212	62,078		335		35
255,169	1,010	25	95	890	47	14,241	45	212	10		36
35,650	18,319			18,319	22	9,495					37
358,234	101,691	7,830	43,765	50,096	113	37,152	109,050	95,567	4,368		38
68,850	48,427	6,805	38,147	3,475	50	13,663	53,127	95,355	4,023		39
18,365	9,422			9,422	9	3,850					40
22,900	30,415	1,000	5,523	23,892	11	4,268			335		41
244,519	585	25	95	465	37	10,371	55,878		10		42
3,600	12,842			12,842	6	5,010	45	212			43
56,700	39,713	3,010	23,665	13,038	35	11,065	27,806	22,862	926		44
36,900	28,213	3,010	20,290	4,913	25	8,651	25,606	22,862	926		45
4,500	3,700			3,700	4	1,250					46
3,500	5,475		3,375	2,100	1	144	2,200				47
8,000	425			425							48
3,800	1,900			1,900	5	1,020					49
161,919	67,565	28,308	26,021	13,236	65	21,979	62,950	25,212	5,931		50
143,469	59,843	28,308	26,021	5,514	48	14,932	62,950	25,212	5,931		51
12,800	7,722			7,722	7	3,177					52
											53
5,650					10	3,870					54
											55
31,750	4,099		522	3,577	13	5,265	4,000				56
											57
3,500	522		522		2	1,800	4,000				58
28,250	3,577			3,577	11	3,465					59
											60
8,650	1,150	1,150			5	1,280			1,920		61
											62
1,700	1,150	1,150			3	280			1,920		63
6,950					2	1,000					64
											65
8,650	1,150	1,150			5	1,280			1,920		66
1,700	1,150	1,150			3	280			1,920		67
6,950					2	1,000					68
											69
2,378,150	2,624,833	1,707,603	881	916,349	1,652	674,015	10,800		2,343,637	514,603	70
											71
1,288,315	1,585,281	1,513,803		71,478	1,057	332,050			1,827,531	282,180	72
1,039,835	1,039,552	193,800	881	844,871	595	341,965	10,800		516,106	232,423	73
967,058	962,013	869,840	881	91,292	527	187,269	10,800		948,347	290,742	74
907,270	917,185	855,920		61,265	484	175,318			931,814	208,072	75
59,788	44,828	13,920	881	30,027	43	11,951	10,800		16,533	82,670	76
229,450	162,998	95,366		67,632	95	33,204			317,889	35,517	77
30,250	37,324	36,214		1,080	38	13,023			161,839		78
199,200	125,674	59,122		66,552	57	20,181			156,050	35,517	79
1,056,332	1,386,257	741,897		644,360	915	389,388			1,077,154	188,344	80
350,795	630,772	621,639		9,133	535	143,709			733,878	74,108	81
705,537	755,485	120,258		635,227	380	245,679			343,306	114,236	82
125,310	113,565	500		113,065	115	64,154			217		83
125,310	113,565	500		113,065	115	64,154			217		84

THE DEVELOPMENT OF INLAND WATERWAYS.

GENERAL REVIEW.

The development of inland waterways during the past decade has not continued to the extent that might be desired, but, sufficiently, however, to encourage renewed efforts for greater success. Further development is necessary to meet the demands of existing commerce, to relieve in a large degree the recurrence of congestion at the several ports, and to promote and enlarge water-borne traffic between the several states.

Of inland waterway improvements fostered by states during the last decade the canal-barge system, developed by New York state at a cost of over \$190,000,000, is the greatest. The most important of private enterprises was the building of a canal across Cape Cod, while the Federal Government has appropriated millions for many important river and harbor improvements all over the country, and a number of examinations and surveys of proposed inland waterways have been authorized by Congress.

Of projects advocated, the most important is a continuous inland waterway from Maine to Florida (known as the Atlantic Intracoastal Waterway), across Florida from the Atlantic coast to the Gulf coast, along the Gulf coast to the Mississippi Valley, up the Mississippi Valley to the Great Lakes, and then utilizing the Hudson River and New York State Barge Canal System to join the traffic of the Great Lakes and the St. Lawrence Valley to the entire coastal region.

It is proposed to canalize rivers and streams along the route selected, to improve bays and sounds, to enlarge existing canals, and to build new canals. Some of the links in this waterway are completed, others under way, some approved, and others to be approved. When these links are welded together the country will have an inland waterway, navigable for canal barges of a standard size, in touch with the seaports, industrial centers, and areas of natural production.

Among the more important links in the Atlantic Intracoastal Waterways are the following:¹

Cape Cod Canal, already completed and in operation.

Long Island Sound.

New York Bay—Raritan Bay.

Raritan Bay to Delaware River (South Amboy to Bordentown, N. J.). A ship canal is to be built across the state of New Jersey connecting these terminals.

Delaware River, Bordentown to Delaware City.

Chesapeake and Delaware Canal—to be purchased and made into a sea-level waterway connecting Delaware River and Chesapeake Bay.

Chesapeake Bay, from head of bay to Norfolk, Va.

Norfolk, Va., to Beaufort, N. C.—an inland waterway crossing Albemarle and Pamlico Sounds. Approved by Congress in 1912. Work under way, probably one-half completed. The project includes the Albemarle and Chesapeake Canal, which was purchased by the Federal Government in 1913.

Beaufort, N. C., to St. Johns River, Fla. The following links between these points have been examined by the Army engineers

and construction of inland waterways recommended: Beaufort, N. C., to Cape Fear, N. C.; Cape Fear to Little River, S. C.; Little River to Winyah Bay, S. C.; and Winyah Bay to Charleston Harbor, S. C. The links under construction are Charleston Harbor to Savannah River, Ga.; Savannah River to Fernandina, Fla.; and Fernandina to St. Johns River, Fla.

This intracoastal waterway along the Atlantic seaboard when completed will include about 1,800 miles of continuous inland navigation, obtained by connecting existing waterways, improving same, and the excavation of about 131 miles. The cost to the Federal Government is estimated at \$47,800,000. In addition, several of the states, cities, and towns have contributed to the project. Into this intracoastal waterway empty the waters of 148 rivers. Many of these rivers are important factors in commercial development, but many more are nearly, if not entirely, useless. It is purposed to improve the latter in accordance with their importance. The combined length of the 148 rivers is 5,365 miles, and they are of inestimable value to the proposed trunk line.

The next link in the greater waterway is across Florida, from the Atlantic Ocean to the Gulf of Mexico, thence along the Gulf coast from western Florida to the Mississippi River. If a more feasible route is not recommended by the Army engineers, the route across Florida will be from Jacksonville via St. Johns and Oklawaha Rivers and canals to Harris Lake (Leesburg), thence by canal and the Withlacoochee River to the Gulf. Part of the route is under construction and some existing canals have been acquired.

An inland waterway from the Mississippi River to Mobile, Ala., is in operation via Lake Borgne Canal, Lake Borgne, Mississippi Sound, and Mobile Bay. Examinations and surveys from Mobile Bay, Ala., to Pensacola Bay, Fla., have been ordered by Congress. Santa Rosa Sound from the east end of Pensacola Bay has been improved, especially the narrows which connects the sound with Choctawatchee Bay. A waterway is in contemplation from Choctawatchee Bay to St. Andrews Bay to connect with a waterway already in operation from St. Andrews Bay to Apalachicola River. Examinations and surveys have been ordered of St. Georges Sound from Apalachicola River to the Gulf of Mexico and for an inland waterway on the Gulf coast of Florida connecting St. Georges Sound with Tampa Bay.

From the Gulf to the Great Lakes, along the Mississippi Valley, is the next link in this great inland waterway. It is proposed to improve the Mississippi River to St. Louis, canalize the Illinois River to Joliet and there connect with the Chicago Drainage and Ship Canal, making a trunk line from New Orleans to Chicago. Another proposed route is via the Mississippi River to Cairo, the Ohio River to Cincinnati, and the Miami and Erie Canal to Toledo, or the Ohio River to Portsmouth, and the Ohio and Erie Canal

¹ Proceedings of Atlantic Deeper Waterway Convention, 1914, page 324.

to Cleveland. These routes will connect directly Lake Michigan and Lake Erie with the Gulf of Mexico.

The New York State Barge System forms the last link in this chain of inland waterways. It extends from the Great Lakes to the St. Lawrence Valley and New England, the starting point of this gigantic waterway.

As vast as the project is, there is to be added to it the possibilities of all its tributaries, for the proper development of inland waterways will make possible complete connections between the internal water systems of this country and through them with other portions of the outer world.

An important tributary, practically a trunk line itself, is the proposed inland waterway from New Orleans to the Rio Grande. The first link in this waterway extends from New Orleans to Morgan City. The most direct route is by way of the Barataria and Lafourche Canal, generally known as Company's Canal. This canal is 97 miles long, 70 to 150 feet wide, and 6 feet deep and is navigable its entire length. The canal is privately owned, but it is purposed to have the Federal Government purchase it and make it a part of the proposed waterway to the Rio Grande. A route via Donaldsville, 140 miles long, has its advocates, while the Plaquemine route, 190 miles, is already available, having been improved by the Federal Government. The latter follows the Mississippi River to Plaquemine, thence southerly to Morgan City by the Plaquemine waterway, which consists of the Bayou Plaquemine, Grand River, and a number of small bays and rivers that have been improved and united. At Morgan City connection is made through the lower Atchafalaya River with the Bayou Teche, which has been canalized. From the Bayou Teche, at or near Franklin, La., to the Mermentau River, and from the Mermentau River to the Sabine River, La., are two links under construction. The link from the Sabine River to Galveston, Tex., awaits the report of the Army engineers, while the following links are under construction: From Galveston to Corpus Christi via West Galveston and Oyster Bays, West Galveston Bay and Brazos River Canal, channel between Brazos River and Matagorda Bay, channel from Pass Cavallo to Aransas Pass via Espiritu Santo, San Antonio, Mesquite, and Aransas Bays, and channel from Aransas Pass via Turtle Cove and Corpus Christi Bay to Corpus Christi, Tex.; from Corpus Christi Bay through Laguna De La Madre to Point Isabel, thence to the mouth of the Rio Grande. Important projects for the development of inland waterways are noted by geographic divisions and states as follows:

NORTH ATLANTIC DIVISION.

Massachusetts.—The conception of a ship canal across Cape Cod dates back over 200 years. Up to 1900 there was a succession of surveys and failures,

but during the last decade the canal has been built at a cost of \$13,500,000 and was opened for traffic July 29, 1914. It is the most important link yet completed in the proposed gigantic inland waterway system which will connect the great business centers of the country and put them in touch with the commerce of the world. The canal proper is 7.68 miles long, but including approach channels, it is 13 miles long. The surface width is 200 feet, bottom width 100 feet, and depth at mean low water 25 feet. It materially shortens the distance between New York and Boston, and vessels passing through the cut avoid the dangers of the outside route which have caused great loss of life, ships, and cargoes.

There are no canalized rivers in the New England states. A preliminary examination and survey of the Connecticut River from Hartford, Conn., to Holyoke, Mass., has been authorized by Congress, to determine whether this part of the river should be canalized. A number of other rivers have been examined with a view of securing increased depth of channels. The construction of a canal or waterway through the southern boundaries of Rhode Island is one of the projects being urged upon Congress.

New York.—The barge-canal improvement made in the state of New York is one of the greatest works of its kind ever undertaken by a single state. It covers a length of 553.8 miles of canal construction suitable for boats of barge-canal dimensions. Five canals were enlarged and united by utilizing natural streams and lakes wherever available: The Erie, stretching across the state from east to west and joining the Hudson River and Lake Erie; the Champlain, extending northerly to Lake Champlain from the eastern terminus of the Erie; the Oswego, leaving the Erie where the waters of the Oneida and Seneca Rivers unite and following the Oswego River to Lake Ontario; the Cayuga and Seneca, starting south from the Erie a little to the west of the Oswego Junction and running first to Cayuga and then to Seneca Lake; and the Black River Canal, extending from Rome to Lyons Falls. The terminals, locks, reservoirs, and dams are on a stupendous scale and embody the latest and best ideas of engineering skill. Of the whole waterway system, about 70 per cent of the total length is in lake or river channel. Towpaths and mule teams have disappeared, steam tugs are used for towing, and many of the barges have their own power.

The Hudson River, located entirely in New York state, has its source in the Adirondack Mountains, about 250 miles in a direct line from the Battery, New York City, and flows in a generally southern direction into New York Bay. The section from Waterford to Hudson, a distance of 38 miles (about 117 miles north of the Battery), is being extensively improved by the Federal Government. A vast amount of channel excavation has been done and much more is required. New

dikes have been built and old ones reconstructed. The old state lock and dam at Troy have been replaced by a new dam and a great lock 520 by 45 feet. The cost to the United States for new work to June 30, 1916, was nearly \$4,000,000. The state of New York and the cities of Albany and Troy have also contributed liberally to the project by constructing and maintaining great terminals, public docks and warehouses, and by cooperating in the building of dikes and by dredging work. The Hudson River, from a line joining the Battery and Ellis Island to the northern limits of New York City, a distance of 16 miles, has also been improved. The largest trans-Atlantic steamers can now reach their pier at Hoboken, N. J. Examination and surveys of the river have been ordered by Congress, with a view to securing a depth of 30 feet from its mouth to Hudson and a depth of 27 feet from Hudson to Troy.

At Buffalo the state government has built a magnificent terminal for the barge-canal system and made other improvements. The city has built a ship canal and dredged it at a great cost, while the Federal Government has deepened Black Rock Harbor, also called Black Rock Canal, and built a lock 650 feet long, 70 feet wide, and 20 feet deep, at a cost of \$1,001,578. There are several canals connecting with the outer harbor owned by corporations.

The proposed waterway (from Lake Ontario up the bed of the Genesee River, over the divide at Cuba, and down the Allegheny River to Pittsburgh, where it will connect with the Ohio and then the Mississippi River) to the Gulf of Mexico still remains a project to be accomplished. Parts of the Allegheny and Ohio Rivers have been canalized and the mouth of the Genesee River improved, but little has been done beyond this, though a through inland waterway from Lake Ontario to the Gulf will be of inestimable value to commerce.

New Jersey.—The greatest project for the development of inland waterways in New Jersey is the construction of a ship canal from Raritan Bay (Morgan) to Delaware River (Bordentown). It is a link in the proposed Atlantic Intracoastal Waterway, a waterway destined to become an important inland carrier for the Atlantic trade of the American and European nations. The pending proposition is for New Jersey to provide the right of way and the United States to build the canal. The state has had a survey made. The center line and monumenting has been completed from Bordentown to Morgan, and the Federal Government has been requested to accept the line as monumented. The purchase and utilization of the Delaware and Raritan Canal, which connects Bordentown and New Brunswick on the Raritan River, has some advocates, but a direct cut across the state, 33 miles in length, 25 feet deep, and 125 feet wide (bottom), is the project that is being urged upon Congress and the New Jersey Leg-

islature. This sea-level ship canal will connect inland commerce with New York City and through Long Island Sound with New England; also it will connect this commerce with the Hudson River, the St. Lawrence River on the north and the Great Lakes, by way of the New York State Barge Canal, on the west. At the southern end the canal will connect with Norfolk, Va., and other points south via Delaware River, Chesapeake and Delaware Canal, and Chesapeake Bay. The rivers of New Jersey are not canalized. The channels of the Passaic, Raritan, and Hackensack Rivers have been made wider and deeper. The Arthur Kill, or Staten Island Sound, which connects upper New York Bay with Raritan Bay, one of the terminals of the proposed ship canal, has also been improved. There are two corporate-owned canals of considerable size. One of these, the Morris Canal, connecting Hudson River (Jersey City) and Delaware River (Easton, Pa.), is 106.7 miles long, 25 feet wide (bottom), and 5 feet deep. It has 32 locks, 11 by 95 feet, and an inclined plane at Newark. The canal is but little used, the traffic in 1916 amounting to only 11,449 tons. The Delaware and Raritan Canal is 44 miles long, 40 feet wide (bottom), and 8 feet deep, and it has 13 locks, 23½ by 210 feet. The traffic in 1916 amounted to 331,006 tons. There is a feeder to this canal, from Raven Rock to Trenton, 22 miles long. An examination and survey has been ordered for an inland waterway on the Atlantic coast between Cape May and New York Bay.

Pennsylvania.—To connect Pittsburgh and Lake Erie by ship canal is a project that western Pennsylvania has advocated for many years. The distance is a little over 100 miles, and to obtain this inland waterway it is proposed to utilize the Ohio River from Pittsburgh to Beaver, Pa., and construct a canal from Beaver to Ashtabula, Ohio, of which a large part will be formed by canalizing rivers and streams. This all-water route will make possible the direct shipment by lake vessels of iron ore from the Lake Superior mines to furnaces along the route of the canal, and the shipment of coal from western Pennsylvania mines to the upper lake ports.

The Ohio River is formed by the junction of the Allegheny and Monongahela Rivers at Pittsburgh, Pa. It flows in a generally southwestern direction and empties into the Mississippi River at Cairo, Ill. The total length of the river is 968.5 miles. For the actual construction of the new locks and dams and the operation and care of the completed structures the river is divided into four sections. The Pittsburgh section extends from the head of the river at Pittsburgh, Pa., to Steubenville, Ohio, a distance of 65.7 miles; the Wheeling section extends from Steubenville to a point 2 miles below Huntington, W. Va., a distance of 245.2 miles; the Cincinnati section extends from a point 2 miles below Huntington to a point 2 miles above Madison, Ind., a distance of 242.7 miles; the Louisville section extends from a

point 2 miles above Madison, Ind. (50 miles above Louisville, Ky.), to Mound City, Ill., a distance of 408 miles. In its original condition the Ohio River was much obstructed throughout its entire length by snags, rocks, and gravel and sand bars, rendering navigation difficult and hazardous. The canalization of the river began in 1875 with the construction of a lock and movable dam at Davis Island, 4.7 miles below the head of the river. Canalization was renewed in 1906, and on July 1, 1916, there were in operation in the Pittsburgh section 10 locks and dams, which cost to construct about \$11,500,000.

The Wheeling, W. Va., section had 5 locks and dams in operation and 4 practically completed. In addition, there were 6 under construction and 3 to be built. The Cincinnati section had but 1 lock completed, 1 nearly so, 4 others under way, and 6 proposed. In the Louisville section there was 1 old lock in operation, a new one under construction to replace it, 2 others under way, and 10 to be built. The Ohio River is thus canalized its whole length. The total number of locks in operation July 1, 1916, was 17; number under construction, 18 (including No. 41, which is to replace old lock No. 41); number to be constructed, 19, making a total of 53. In connection with new lock No. 41, the Louisville and Portland Canal is being widened to 200 feet. This canal is 2 miles long and provides a passage around the falls of the Ohio River at Louisville. The lock is at the lower end of the canal and the dam at the upper end. The amount expended in all projects to June 30, 1916, was \$39,603,695. Amount (estimated) required to be appropriated for completion of existing projects, \$39,066,604, which amount includes balance available for fiscal year ending June 30, 1917. The report of the Chief of Engineers, United States Army, for 1916, page 1212, states that "the work of canalization of the Ohio River is not sufficiently advanced to have any appreciable effect on freight rates. * * * The great future benefit of the improvement will be felt only when the slack-water system has been extended far enough down stream to permit of continuous navigation at all times (except when interfered with by floods or ice) over a longer section of the river. It should be noted, however, that the large manufacturing concerns state that the certainty of coal delivery by water is a much greater advantage than the actual saving in cost." The Allegheny and Monongahela Rivers are both canalized, and water transportation has thus been rendered easier and safer. The Allegheny has 3 locks and dams between Pittsburgh and Natrona, a distance of 24 miles. Locks and dams Nos. 4 to 8, inclusive, intended to extend slack water from Natrona to Rimerton, 37 miles, remain to be built. The Monongahela River is canalized its entire length, 128 miles. It has 15

locks and dams in operation. The improvement has made water transportation thoroughly dependable and thus has enabled a heavy traffic in freight to develop with a marked effect on rates.

The Delaware River has its source in southeastern New York, flows in a generally southern direction, forms the boundary line between the states of New York and New Jersey on the east and Pennsylvania and Delaware on the west, and empties into Delaware Bay. The total length is about 315 miles. Sections of this river are being extensively improved. The part from Trenton, N. J., to Delaware City forms an important link in the proposed Atlantic Intracoastal Waterway. The Delaware River is already an ample waterway for the purposes of the proposed continuous inland route, but it is desired to have the channel deep enough for vessels of increased draft. There are 3 canals owned by corporations: The Schuylkill Navigation Co. Canal, the Lehigh Coal and Navigation Co. Canal, and the Delaware Division Canal. The first named extends from tidewater at Philadelphia to Port Clinton, Pa., a distance of 90 miles, and has 55 locks, 18 by 110 feet; the Lehigh extends from Easton to Mauch Chunk, is 47 miles long, and has 49 locks; and the Delaware Division Canal, owned by the Lehigh Co., has 25 locks, extends from Easton to Bristol, and is 59 miles in length.

SOUTH ATLANTIC DIVISION.

Delaware.—The state of Delaware, having the Delaware River as one of its boundary lines, is naturally much interested in the river's improvement, which was referred to in connection with the inland waterways of Pennsylvania. This river is directly beneficial to the commerce of four states, New York, New Jersey, Pennsylvania, and Delaware.

The Chesapeake and Delaware Canal connects the Delaware River with Chesapeake Bay. It is 13½ miles in length, 60 feet wide (surface), and 10 feet deep and has 3 locks, 220 by 24 feet. It is owned by a corporation and was opened for navigation in 1829. The amount of freight carried annually, as well as the location of the canal, makes it a very important one. Its purchase by the United States is proposed as a necessary link in the great Atlantic Intracoastal Waterway.

An inland waterway or tidal canal 12 miles in length, between Rehoboth Bay and Delaware Bay, is under construction. It will be 6 feet average depth at mean low water and 40 to 50 feet in width. The minimum usable depth in 1916 was 2½ to 5 feet. The state and interested parties have provided the right of way free of cost to the United States.

Maryland.—The Susquehanna and the Patapsco Rivers have been improved, the latter very extensively. The Patapsco River is of considerable importance to the city of Baltimore. Above the city it is a

flowing stream seldom more than 200 feet wide, while below it is an arm or inlet of Chesapeake Bay from 1 to 4 miles broad. There has been spent on this river over \$8,000,000 by the Federal Government and \$750,000 by the state and city. In addition, the city of Baltimore has spent nearly \$12,000,000 on the inner harbor.

The Potomac River begins 21 miles below Cumberland, Md. It is about 286 miles long and empties into Chesapeake Bay. The channel at Washington, D. C., and in other places has been deepened and widened so that larger and deeper-draft vessels are now engaged in trade.

One of the most important private canals of the country is the Chesapeake and Ohio, which extends from Washington, D. C., to Cumberland, Md., a distance of 185 miles. It varies in width from 50 to 100 feet (surface) and has a minimum depth of 6 feet. It has 75 locks, 15 by 100 feet. The traffic tonnage of the Chesapeake and Ohio Canal is mainly coal.

Virginia.—The development of the Potomac River is of much interest to Virginia. Improvements have been made at Alexandria which enable deep-draft steamers and vessels to enter the port. Trade has increased, and general results are beneficial to this city. The Rappahannock River, which rises in the Blue Ridge Mountains and flows southeasterly for about 212 miles to Chesapeake Bay, has been widened and deepened so that coastwise trade has been afforded access to the upper river. The James and Appomattox Rivers have been improved so that navigation is safer and easier, and larger and deeper-draft vessels can be used.

West Virginia.—There are several canalized rivers within the borders of West Virginia. The Kanawha, formed by the junction of the New and Gauley Rivers a short distance above Kanawha Falls, flows about 97 miles in a generally northwestern direction and empties into the Ohio River at Point Pleasant, W. Va. It is canalized practically its entire length, having 10 locks and dams located at various points along the river from Montgomery to Point Pleasant. The improvement has rendered transportation by water easier and safer. The commerce consisted principally of coal and timber products.

The Little Kanawha, another canalized river of West Virginia, though longer than the Kanawha, is not as deep nor as important. It is 158 miles long, but is canalized only from its mouth to Creston, a distance of 48 miles. There are 5 small locks and dams, and the amount of freight transported, principally timber products, is less than 100,000 tons annually.

The Ohio River, one of the boundary lines of West Virginia, and the Monongahela River, which has its source in this state, are described under the rivers of Pennsylvania.

North Carolina.—The route of the inland waterway paralleling the Atlantic coast between Norfolk, Va., and Beaufort Inlet, N. C., a distance of 186 miles, is an important part of the Atlantic Intracoastal Waterway. It lies in natural waterways, with the exception of four land cuts which connect existing watercourses. It includes the Albemarle and Chesapeake Canal, purchased by the United States in 1913 for \$500,000. Beginning in 1873, improvements were made in sections, but in 1912 provision was made for constructing the entire waterway at an estimated cost of \$5,400,000. The work is progressing steadily and was one-fourth completed on June 30, 1916. There is a waterway extending from Beaufort to Swansboro, through the waters of Bogue Sound, a shallow sheet of water about 25 miles long and from 1 to 3 miles wide, which has a channel 100 feet wide and 3 feet deep at ordinary low water. At Swansboro it connects with a tidal waterway that extends to New River, a distance of 22 miles. It is proposed to further improve these two waterways as part of the link in the Atlantic Intracoastal Waterway, from Beaufort to Cape Fear.

Another important inland waterway extends south from Norfolk via Elizabeth River, Deep Creek, Dismal Swamp Canal (known also as Lake Drummond), Turners Cut, and Pasquotank River to Albemarle Sound, N. C., a distance of 68.7 miles, thence to Pamlico Sound via Croatan Sound. Considerable freight passes over this route, the value of which in 1916 was \$10,987,651.

Cape Fear River from its mouth to Fayetteville is undergoing improvement. Below Wilmington a channel of uniform depth of 26 feet at mean low water has been dredged, with a width of 280 to 400 feet on the ocean bar and 150 to 300 feet in the river channels. Above Wilmington it is proposed to secure by canalization, dredging, and snagging a navigable depth of 8 feet at low water to the head of navigation at Fayetteville, 115 miles. Navigation has been secured as far as Browns Landing, 71 miles above Wilmington, and boats drawing 7 feet of water go this distance, where formerly they could go only to Kings Bluff, 39 miles above Wilmington. A lock and dam has been built at Kings Bluff, and another one is nearly completed at Browns Landing. The river is tidal to Kings Bluff, where canalization begins. The Roanoke, Neuse, Trent, New, and other rivers of North Carolina have been considerably improved, to the advantage of navigation and freight rates.

South Carolina.—This state has practically no canalized rivers nor any large canals. The Congaree River from Columbia to Granby, a distance of 2 miles, not being navigable because of swift currents and numerous ledges and bowlders, was canalized in 1904 by the building of a lock and dam at a point 2 miles below Gervais Street Bridge, Columbia, and 49

miles above the mouth of the river. The entire river was dredged and snagged to the extent that a 6-foot channel was secured for navigation at all but extreme low-water stages. Among other rivers of the state that have been improved are the Santee, Wateree, Great and Little Pedee, Waccamaw, and Ashley. The Estherville and Minim Creek Canal, connecting Santee River and Winyah Bay, was opened for traffic in 1906. It is 5 miles long and 6 feet deep, with a minimum width of 20 feet.

The South Carolina coast contributes three links to the Atlantic Intracoastal Waterway. One extends from Little River to Winyah Bay, covering a distance of over 200 miles, construction of which has been recommended. Another link is a proposed channel 7 feet deep from Winyah Bay to Charleston via the existing Estherville-Minim Creek Canal, and thence through a marsh, utilizing natural waterways where possible, including the inland waterway between Charleston Harbor and Alligator Creek (opposite McClellensville), which, though recently completed, has a depth of only 3 to 4 feet. The third link extends from Charleston Harbor to Savannah, Ga. Part of this route is covered by an inland waterway which connects Savannah, Ga., and Beaufort, S. C., via Fields Cut, Mud River, and Ramshorn Creek. It has a length of 53 miles, a minimum width between banks of 200 feet, and a minimum low-water depth of 7 feet.

Georgia.—Along the coast of Georgia and a portion of Florida is an inland waterway, 147 miles long, which is an important connecting link in the intra-coastal waterway. The waterway is tidal throughout and connects Savannah, Ga., and Fernandina, Fla., via Skidaway Narrows, Creighton Narrows, Little Mud River, Frederica Creek, Jekyl Creek, and Cumberland River. Before any improvement was undertaken the controlling depth was about 3 feet at mean low water. After improvement, the controlling depth was 7 feet over the entire route. As a result of this improvement, coastwise commerce in vessels of moderate size has been greatly extended.

The Savannah River is formed by the junction of the Tugaloo and Seneca Rivers on the north-western boundary line. It flows southeast on the boundary line and empties into the Atlantic Ocean. The river has been improved below and above Augusta and at Augusta (217 miles from the mouth). At Savannah (17 miles from the sea) the river and harbor have been provided with a 21 and 26 foot channel. In consequence of these improvements commerce has greatly increased, freight rates have been reduced, and the establishment of permanent terminals on the Augusta water front made possible.

The Coosa River belongs to both Georgia and Alabama. The original project for its improvement contemplated the opening of a continuous water route of transportation from the Mississippi River

to the Atlantic Ocean by way of the Ohio, Tennessee, Coosa, Etawah, Ocmulgee, and Altamaha Rivers, with canals from the Tennessee to the Coosa and from the Etawah to the Ocmulgee. It was designated as the "southern route" and the estimated cost was over \$7,000,000. The Coosa River, however, was canalized only from Rome, Ga., to 7 miles below Riverside (58 miles from Gadsden), a distance of 165.5 miles. There are 5 locks and 6 dams in operation at various points along the route. A lock was also constructed at Wetumpka, 11 miles from the mouth of the river, but it has never been put in commission.

Florida.—The last link in the Atlantic Intracoastal Waterway extends from Cumberland Sound, opposite Fernandina, Fla., to St. Johns River, about 6 miles from its mouth. It is 29 miles long, 100 feet or more wide, and 7 feet deep at mean low water. The channel was secured by dredging Sisters Creek and other natural inside waterways. What were formerly tortuous channels through salt marsh and shallow unnavigable stream were changed to a tidal waterway that has opened up a valuable trade route and forms an important and much-used link in the inside route down the coast. The waterway was completed and opened for navigation in 1915.

The second great link in the proposed grand trunk line of inland waterways will begin at Jacksonville and cross the central part of Florida to the mouth of the Withlacoochee River near Cedar Keys. Connection will also be made at Jacksonville with an inland waterway to Miami and Key West. This waterway consists in part of the following rivers, North, Halifax, Indian, Hillsboro, and New River, and part of a continuous canal from St. Johns River to Miami (Biscayne Bay), constructed by the Florida Coast Line Canal and Transportation Co. This company having relinquished in 1894 to the United States certain rights and privileges granted to the company by the state of Florida, the improvement of the canal was undertaken by the Federal Government in conjunction with the Indian River. The result of the improvement is a continuous inland waterway, 356 miles long, 85 feet wide, and 5 feet deep, partly natural and partly artificial, extending along the east coast of Florida from St. Johns River to Biscayne Bay. The improvement enables small craft to ply up and down the coast without incurring the dangers of outside passage. It is used by commercial boats carrying freight and passengers to and from the towns along the river and by yachts and pleasure craft. Improved navigation is also proposed between Miami and Key West, a distance of 160 miles. At Key West there is a good harbor and ship channel. The northwest passage from Key West to the Gulf ports has been made safer. Improvements are under way on the west coast of Florida and a survey has been ordered for an inland waterway from Tampa Bay to St. George Sound.

St. Johns (the most important river in Florida), the Apalachicola, Oklawaha, Kissimmee, Caloosahatchee, Manatee, Withlacoochee, Suwanee, and other rivers and creeks have been deepened and improved generally.

There are numerous drainage canals in Florida, some of which are navigable to small craft. The most important ones drain the Everglades and are owned by the state.

The water hyacinth, a fresh-water plant that spreads rapidly and blocks the streams and lakes with floating masses that seriously impede navigation, is as prevalent in Florida as in Louisiana and some other states. Various devices have been tried for removing this dangerous plant or curtailing its power to do damage, some of which, like the grapple, are very successful.

NORTH CENTRAL DIVISION.

Ohio.—Prior to 1913 this state had a canal system of considerable importance. The disastrous floods of that year, however, put out of commission the two principal canals—the Miami and Erie, connecting Toledo and Cincinnati, and the Ohio and Erie, connecting Cleveland and Dresden. The necessity for increased transportation facilities within the state and between the Great Lakes and the Gulf of Mexico may cause the restoration of these abandoned canals and their conversion into modern waterways of barge dimensions. This restoration may also be influenced by the fact that there is in existence, according to the annual report of the Ohio Canal Commission for 1903, a very old agreement, made by the Federal Government and the state of Ohio, whereby “the Government, by the terms of the grant of lands to aid the state in the construction of the canals, requires the state to construct, keep open, and forever maintain a canal as a public highway between Lake Erie and the Ohio River, upon which the United States may at all times transport troops and munitions of war free from tolls.”

Another great project which will materially benefit the lake region has been given a start by an act of Congress passed July 25, 1912, which requires an examination and survey for an artificial waterway from Lake Erie, at or near Toledo, to the southerly end of Lake Michigan by way of Maumee River and the city of Fort Wayne, Ind., or other practical route. The duty of making this examination and survey was assigned to a special board of engineer officers in 1916.

There are only two canalized rivers in the state, the Muskingum and the Ohio, the last named being the boundary line between Ohio and Pennsylvania, West Virginia, and Kentucky, and is discussed under the rivers of Pennsylvania, the state in which the river has its source. The Ohio River has 17 locks and dams in operation. One of these is situated near Steubenville and another near Fernbank, Ohio. There are, however, 4 more under construction and 3 to

be built near other Ohio towns. The Muskingum River is canalized from its mouth (Marietta) to Dresden, a distance of 91 miles. The original canalization was done by the state from 1837–1841, at a cost of about \$1,500,000. The United States in 1887 took over these improvements, consisting of 12 locks, 11 dams, and 5 short lateral canals, most of which were badly out of repair. The work of restoration was completed about 1891. There are now 11 good locks (1 a double or tandem) and dams, transportation is more reliable, and the improvement has permitted the development of water power which is leased by the United States Government for commercial purposes and is the source of considerable income. The construction of lock and dam No. 11 at Ellis, Ohio, was contingent on the state or some other agency expending not less than \$200,000 on that part of the Ohio Canal system which connects the Muskingum River at Dresden with Lake Erie. This amount was expended on the canal; but, as has been stated, the flood of March, 1913, damaged the canal to such an extent that it has been abandoned. The river, however, is in good condition, and the commerce in 1915 amounted to 114,632 tons, valued at over \$1,000,000.

Indiana.—The Wabash River rises in western Ohio and empties into the Ohio River at a point 121 miles from the mouth of the Ohio. It is about 517 miles long. General navigation above Terre Haute is impracticable, even at high stages of water, on account of the obstruction of the river by bridges, and below Terre Haute because of bars and snags.

Efforts were made to improve the river by snagging and dredging and at designated localities to deepen the bed of the river through rock obstructions. A new lock was built at Grand Rapids, near Mount Carmel, Ill., replacing the old one built in 1842 by a private corporation and purchased by the United States in 1875. The old dam was also extensively repaired. This was in 1893, and the improvement has afforded slack-water navigation for a distance of about 12 miles above the lock at Grand Rapids. Practically nothing remains of the improvements on this river except the lock and dam and a number of cuts through rock bars. Even the slack-water navigation for 12 miles above the lock is of little value, as through navigation up the river is impracticable.

Illinois.—The Illinois and Mississippi Canal was first opened to navigation in 1895. It was then about 5 miles in length. In 1907 it was enlarged, so that it now extends from the Illinois River, near La Salle, across the state via Bureau Creek Valley and over the summit to Rock River; thence by slack water in Rock River about 8½ miles, and by canal around its lower rapids to the Mississippi River at the mouth of Rock River. The main canal is 75 miles long, 80 feet wide at the water surface, and 7

feet deep, with 33 locks, 150 by 35 feet, in the chamber. The main object of this canal is to furnish through navigation from Chicago to the Mississippi River.

The Chicago Drainage and Ship Canal was built by the Sanitary District of Chicago under a state law for sanitary purposes and never has had the sanction of Congress. It extends from Chicago to Joliet, a distance of about 32 miles. The surface width of the canal varies from 160 to 290 feet, and the depth is generally from 22 to 26 feet. Its cost was \$55,208,899.

The Illinois and Michigan Canal, 95 miles long, 60 feet wide at surface, and 6.4 feet deep, with 11 locks, is owned by the state of Illinois and extends from Chicago to La Salle. It has been in existence since 1848, and though it has cost over \$9,000,000 is now in need of a thorough rehabilitation to be of practical use. The Illinois River is canalized from La Salle to Grafton, a distance of 223 miles. The Federal Government built and controls two locks and dams below Copperas Creek, one at Kampsville, the other at La Grange. The state built the lock and dam at Henry and completed the one at Copperas Creek after the United States had spent \$62,359 on the foundation for the lock.

The Wabash River, which flows between Illinois and Indiana, is described in connection with the waterways of Indiana. Among other rivers in Illinois that have been improved are the Chicago and the Calumet.

Michigan.—To keep pace with the tremendous increase in trade to and from the lake region, the United States constructed a great ship channel, 21 feet deep and 300 or more feet wide, in the shallows of the connecting waters of the Great Lakes between Duluth, Chicago, and Buffalo, at a cost of over \$3,000,000. The channel was practically finished in 1909, but additional dredging has been going on ever since. The waters chiefly affected were the St. Marys River, Lake Huron, St. Clair River, Lake St. Clair, and the Detroit River. A greater project, however, in the development of water-borne traffic to the Great Lakes is the vast improvement under way at St. Marys Falls. The first canal at the falls was completed in 1855 by the state of Michigan and turned over to the United States in 1881. Since 1857 work by the United States has been in progress in this locality, which has consisted in widening and deepening of channels; the construction at the Falls of the Weitzel Lock, 515 by 80 feet; the construction on the site of the old state locks of the Poe Lock, 800 by 100 feet; the completion of a new canal and third lock, 1,350 by 80 feet; the enlargement of the old state canal so that it has at present a width varying from 108 to 500 feet; the construction of a movable dam for closing this canal in an emergency; and the beginning and prosecution of the work on the fourth lock. This lock is to be the same size as the third lock, which is the largest in the country and fre-

quently accommodates 5 vessels of average size in one lockage. The new canal is called North Canal and runs parallel to the first one, known as South Canal. The Weitzel and Poe Locks are in the South Canal and the third and fourth locks are in the North Canal. Including the dredging of Hay Lake and Neebish Channels which extend from the canal at Sault Ste. Marie to Lake Huron, a distance of about 50 miles, the improvement thus far has cost over \$20,000,000.

The St. Clair Flats Canal, consisting of two dredged cuts, is located in Lake St. Clair at the mouth of the St. Clair River. It is an important link in the waterway connecting Lakes Erie and Huron, as all commerce passing between the lower and upper lakes goes through this canal. The total tonnage for 1916 was 95,370,752 tons, valued at \$1,010,929,971. The canal is about 3 miles long, 300 feet wide, and 20 feet deep.

The Keweenaw Waterway or Canal, formerly known as the Portage Lake Canal, is a navigable channel, 25 miles long, 120 feet minimum width (bottom), and 20 feet deep, partly natural and partly artificial. Extending across Keweenaw Point, Mich., it connects Keweenaw Bay and Lake Superior and affords this copper-mining district increased commercial facilities.

Some of the important rivers of Michigan are the Detroit, Grand, Saginaw, Black, and Clinton, all of which have been improved. The Detroit River, part of the Great Lakes route, is 31 miles long and flows from Lake St. Clair into Lake Erie. The work done on this river has been dredging, rock excavation, and the removal of bowlders, costing over \$10,000,000. The controlling depth of the Amherstburg Channel is 23.1 feet, and of Livingston and Fighting Island Channels, 24.1 feet. Vessels carrying bulk freight, which forms about 95 per cent of the total tonnage, used all the available draft, the freight amounting to 82,514,457 tons.

Wisconsin.—Fox River rises in Columbia County and flows in a northerly direction into Green Bay. It is canalized its full length of 176 miles. Prior to 1872, when the United States began improvement, the state had built 22 locks and 11 dams. Control of these having been relinquished by the state, they were rebuilt by the United States and 5 new ones added, making a total of 27 locks of an average size of 35 by 170. Wolf River, 220 miles long, a tributary of the Fox River, was dredged and snagged as far as New London, a distance of 47 miles. These improvements created valuable water power and provided better transportation and reduced freight rates. The Wisconsin River, which is only 2 miles from the Fox River at Portage, has not been improved since 1887. On the west shore of Lake Michigan is a ship canal about 1½ miles long, which connects Lake Michigan and Sturgeon Bay. Its width is 160 feet and its depth 21 feet. The principal effect of the canal is to shorten the distance from ports on the west shore of Lake Michigan to Menominee Harbor

by about 50 miles and to Green Bay Harbor by about 70 miles.

Minnesota.—The Mississippi River has its source in numerous lakes in the northern part of Minnesota, its origin being traced to Lake Itasca. It flows in a southerly direction for about 2,460 miles and empties into the Gulf of Mexico. It is the greatest river of the country and has cost a large amount of money to maintain and improve. The part of the river from the Head of Passes to the mouth of the Ohio River has been in charge of the "Mississippi River Commission" since 1879. The improvement under this commission consisted of open channel work, dredging, and building bank revetments and levees. The improvement provides a safe and easy channel for navigation and a preventive to the destructive effects of floods in all except the most extreme high waters. Other sections of the river have also been improved and at some places the river has been canalized. A lock and dam was built and opened for traffic in 1907 between St. Paul and Minneapolis. The lock is out of commission, but a new one 350 by 80 feet has been under construction for some time and is now practically completed. A lock 80 by 325 feet has also been constructed at Moline, Ill. It forms a link in the improvement of the Rock Island Rapids and overcomes a rocky chain, the swiftest on the rapids. The Mississippi River is also canalized at Keokuk, Iowa, at the Des Moines Rapids. A closed lateral canal 8 miles long was built and opened to navigation in 1877. This, with a channel cut through the rock bed of the river over the remaining 4 miles of rapids, was intended to be a permanent aid to navigation. The improvements were made obsolete by the construction of the power dam at Keokuk, the backwater of which submerged them. The Mississippi River Power Co. has, in lieu of improvements destroyed, provided a single lock at Keokuk, 380 feet long and 110 feet wide, at a cost of over \$1,000,000, which, with dry dock, all appurtenances, grounds, and buildings, was transferred to the United States. A number of reservoirs have been built at the headwaters of the river, which has resulted in a greater channel depth and more uniform flow in the Mississippi River above Lake Pepin during the navigation season and has made possible continuous navigation during the season on some stretches where formerly it was subject to interruption on account of low water.

The Red River (of the North) has its source at the confluence of the Bois de Sioux and Otter Tail Rivers at Breckenridge, Minn. It forms the boundary line between Minnesota and North Dakota and flows in a northerly direction to Lake Winnipeg in Canada, the latter discharging through the Nelson River into Hudson Bay. Its length from source to the international boundary is about 400 miles, all of which has been improved. The average depth is 3 feet at mean low

water, and the greatest depth 4 feet. The river, however, is little used for commerce on account of the proximity of railroads.

The Red Lake River, which empties into the Red River, has been improved for a distance of 71 miles of its full length of 190 miles. Logging operations having ceased, there is no commerce on the river at the present time. The Minnesota River is about 400 miles long; it has its source in South Dakota, flows easterly, and empties into the Mississippi River at St. Paul, Minn. No freight has moved on this river during the past few years, it being used only by excursion steamers and small pleasure craft. Warroad River, a short stream connecting Warroad Harbor and Lake of the Woods, which is part of the boundary between Minnesota and Canada, was dredged to the extent that a channel 200 feet wide and 8 feet deep at mean low water was completed. The improvement permits the transfer of freight between rail and water at the only American port on the lake, and has also made navigation easier and safer.

Missouri.—The Missouri River, the longest river in the United States, begins in southwestern Montana, and enters the Mississippi River about 18 miles above St. Louis, 2,551 miles from Three Forks, Mont., its source. The river is being improved by the Federal Government in three sections: First, from Kansas City to its mouth, 392 miles; second, from Kansas City to Sioux City, Iowa, 415 miles; third, from Sioux City to Fort Benton, Mont., 1,478 miles. Up to June 30, 1916, over \$11,000,000 had been spent on section 1. The improvement consists of the protection of banks by revetments, the contraction of channels by dikes, the removal of snags and miscellaneous obstructions, and the felling of trees on caving banks. Navigation has thus been made easier and freight rates have been reduced. The amount of freight carried during 1916 was 211,371 tons, valued at \$6,335,313. Similar improvement has been made on section 2 at a cost of \$2,564,871, and on section 3 at a cost of \$2,894,913. The commercial tonnage reported for section 2 in 1916 was 105,287 tons, mostly sand dredged from the river bed and hauled short distances. The tonnage for section 3 was 22,151 tons, principally grain, manufactured articles, building materials, and coal.

The Osage River, though 500 miles long, is canalized only from its mouth to 7 miles above. There is but one lock and dam, located near Osage City, Mo. The lock is 220 feet long, with a clear width of 42 feet. The commercial tonnage reported for the river in 1916 was 13,999 tons, and through the lock, 1,120 tons.

The Gasconade River, 200 miles long, and located entirely in Missouri, is a nontidal stream that has been changed from a condition of alternate pools and shoals of sand and gravel, obstructed by snags, to a river navigable the greater part of its distance, affording shippers a regular means of transportation by boat.

SOUTH CENTRAL DIVISION.

Kentucky and Tennessee.—The Tennessee River, a nontidal stream, has its source in eastern Tennessee and is formed by the junction of the French Broad and Holston Rivers near Knoxville, Tenn. It crosses northern Alabama, touches Mississippi, crosses Tennessee and Kentucky, and empties into the Ohio River at Paducah, 652 miles from its source. Like other rivers of the Mississippi Valley, it consists of a series of pools separated by shoals. These shoals, together with bars, snags, excessive slopes, small depths found at the shoals, and other obstructions, make navigation difficult. The river, however, with its principal tributaries, forms a system of internal waterways of considerable importance, and the Federal Government has made extensive improvements. The river up to June 30, 1916, has been improved in sections. Section 1 extended from Chattanooga 188 miles north; section 2, from Chattanooga to Riverton, 238 miles; and section 3, from Riverton 226 miles below. The minimum available depth in section 1 is one-half foot at extreme low water, but the river is usually navigable for 1 foot draft throughout the year. There are two canals in section 2; one is at the Muscle and Elk River Shoals and the other at the Colbert Shoals. The Muscle Shoals extend from Browns Island to Florence, Ala., a distance of 36 miles. The canal was built in two sections—one on the right bank with nine locks, and one aqueduct at Big Muscle Shoals, and the other on the left bank with two locks, at Elk River Shoals. The available depth at low water is 5 feet, but this depth was not obtained between the two divisions of the canal, a minimum extreme low-water depth of 1 foot being formed above lock A. The Colbert Shoals Canal is 8.06 miles long, 112 feet wide (bottom), and 7 feet deep, with a lift lock at the lower end of the canal 80 by 340 feet. The canal and lock were completed and placed in operation in 1911. They were built to surmount the obstructions known as Colbert and Bee Tree Shoals, situated between Colbert Shoals and Riverton. The Big Bend, Bear Creek, and Indian Creek Shoals in the part of the river below Riverton have been made navigable.

The Cumberland River is formed by the junction of Poor and Glover Forks in eastern Kentucky about 687 miles above its mouth and flows west to Burnside, Ky., from whence it makes a loop into Tennessee, passes Nashville, and returns to Kentucky, emptying into the Ohio River near Smithland, Ky. Between Burnside, Ky., and Nashville, Tenn., a distance of 326 miles, and below Nashville to the distance of 192 miles the river has been canalized. Over \$5,000,000 have been spent to date. Above Nashville there are 8 locks and dams in operation, while below Nashville there is 1 in operation, with 3 more under construction. The depth of the river varies from 1 to 6 feet.

The Big Sandy River, formed by the junction of the Levisa and Tug Forks Rivers at Louisa, Ky., flows north 27 miles and empties into the Ohio River at Catlettsburg, Ky. The river and a portion of each fork are canalized. Transportation has been rendered safer and easier, but the improvement has but little effect on the nature of commerce and freight rates.

The Kentucky River begins near Beattyville, Ky., flows in a northwesterly direction for about 255 miles, and empties into the Ohio River at Carrollton, Ky. Part of the river has been canalized since 1844, the year the state completed and put into operation 5 locks and dams. These state locks were taken over by the Federal Government in 1879. They were reconstructed and slack water extended to the three forks at Beattyville, at a cost of over \$1,000,000. Nine new locks and dams have been added and navigation has been correspondingly improved.

The Green and Barren Rivers both lie entirely within Kentucky. The Barren is 108 miles long and empties into the Green River. It is canalized from its mouth to Bowling Green, a distance of 29.5 miles. The Green River is 345 miles long and empties into the Ohio, about 8 miles above Evansville, Ind. This river is canalized from mouth to Mammoth Cave, a distance of 196 miles. Locks, dams, and other improvements have cost nearly \$3,000,000. The improvement has afforded uninterrupted navigation over about 217 miles of river and opened to commerce a large section of country otherwise practically inaccessible.

The Louisville and Portland Canal is 2 miles long and extends around the falls of the Ohio River at Louisville. It is an old canal, built by a private corporation under a charter granted by the state of Kentucky in 1825. The first boat passed through the canal December 22, 1830. The United States purchased some of the stock of the company in 1826. Traffic having steadily increased, it became necessary to widen the canal, enlarge the locks and dams, and make numerous improvements, of which the United States assumed charge in 1868, but the operation of the canal and collection of tolls remained under control of the corporate management until 1874, when the entire control of the canal was assumed by the United States. Tolls were entirely abolished in 1880.

Alabama.—The Black Warrior, Warrior, and part of the Tombigbee Rivers form practically a single stream, with its source in northern Alabama, which flows in a southwesterly direction and unites with the Alabama River to form the Mobile River, 45 miles above Mobile Bay. The total length of the stream from the junction of the Mulberry and Locust Forks to the mouth is 362½ miles. When dredging and snagging were begun back in the seventies, some parts of these rivers were not navigable, and some parts only certain months of the year. It is possible now, after improvement, to

carry tows 50 feet wide and loaded to a 6-foot draft from Mobile to Sanders Ferry on the Mulberry Fork, and to Nichols Shoals on the Locust Fork, a distance of $443\frac{1}{2}$ and $423\frac{1}{2}$ miles, respectively. The cost of the improvement, including 17 dams and 18 locks, was over \$9,000,000. It is practically completed and is being used by coal and packet companies for through shipments in addition to the local traffic.

The Tombigbee River is canalized from McGrews Shoals to 15 miles above Demopolis, a distance of about 135 miles. From this point to its source, about 300 miles, it has been improved, but not canalized. Below McGrews Shoals (lock 1) to its mouth, 66 miles, the river is tidal and navigable.

Another project of great importance to the state was the improvement of the Alabama and Coosa Rivers. The channels were deepened and widened, dams and locks were built for the latter stream, and both rivers are now navigable for several hundred miles to boats of much greater tonnage than formerly.

An examination and survey has been authorized by Congress for an inland waterway from Mobile, Ala., to Pensacola, Fla., along the Gulf coast. This is a link in the greater waterway from Florida coast to the Mississippi River.

Mississippi.—The Yazoo, Pearl, Pascagoula, Leaf, Chickasawhay and other rivers of less importance, the Mississippi Sound, and many harbors and passes of the state have been improved to a large extent during the last decade. No canals have been built nor rivers canalized, but a lock and dam are being constructed at Callao Landing on Big Sunflower River.

Arkansas.—The Arkansas River, 1,460 miles long, has its source in central Colorado, flows southeasterly through Kansas, Oklahoma, and Arkansas, and empties into the Mississippi River. Fort Gibson, Okla., on the Neosho River, 2 miles above its mouth and 463 miles above the mouth of the Arkansas River, is regarded as the head of steamboat navigation. Over \$3,000,000 have been spent, principally for snagging, but some for dredging, contraction works, and bank revetment. Improvement in navigation is, however, slow because there are numerous cavings of banks, which cause shifting channels.

White River rises in northwestern Arkansas, flows north into Missouri and thence southeasterly through Arkansas, emptying into the Mississippi River about 87 miles below Helena, through a mouth common to both the White and Arkansas Rivers. The length is 690 miles, 301 of which, from mouth to Batesville, are under improvement. The improvement is beneficial, as snagging has cleared the channels and rendered the full natural depth of the stream available. Upper White River is canalized from 1 mile below Batesville to Guion. Three locks (175 by 36) have been constructed and are in operation.

The Ouachita River has been canalized from Franklin Shoals to Monroe, La., a distance of 119 miles. Three locks have been completed, located at Franklin Shoals and Felsenthal, Ark., and Monroe, La. Three others are being built.

Other Arkansas rivers, the Cache, Black, Current, St. Francis, Saline, etc., have been improved, and some preliminary examinations and surveys authorized by Congress.

Louisiana.—The great Mississippi River, emptying into the Gulf of Mexico in the southeastern part of Louisiana, makes the system of internal waterways of the state of considerable importance. There are several mouths of the river. Two of these, the South Pass and Southwest Pass, have received considerable attention from the Federal Government, and to date about \$20,000,000 have been spent in improvements. These improvements have made New Orleans a valuable port of entry. Larger and deeper-draft vessels enter the harbor and the cargoes for coastwise and foreign commerce are greater, with transportation rates much less than rail rates.

An intracoastal waterway along the coast from the Mississippi to the Sabine River is under construction and several links are completed. The Atchafalaya River from Morgan City to the Gulf of Mexico has been improved, together with other rivers and bayous. There are several canals, the most important being the Barataria and Lafourche or the Company's Canal, New and Old Basin, Harvey's, and Lake Borgne, all privately owned except the New Basin, which is owned by the state of Louisiana.

Texas.—Important improvements are under way in this state. There is the Coast Inland Waterway, already referred to, which is a link in the great trunk line contemplated from the Mississippi River to the Rio Grande. The Trinity and Brazos Rivers are being canalized in part. The Guadalupe from its mouth to Victoria has been dredged and snagged, and Congress has authorized a preliminary examination and survey to determine whether the addition of locks and dams will bring about better results. The Sabine River to Orange and the Neches River to Beaumont, including the Sabine-Neches Canal, have been improved, at a cost of over \$1,000,000, to the extent that deep-draft ocean-going vessels can go from the Gulf to Beaumont and Orange. The harbor at Sabine Pass and the Port Arthur Canal have been made deep enough for ocean-going vessels to enter.

The improvement of the West Galveston Bay and Brazos River Canal which was purchased by the Government in 1902 and extends from Brazos River to Oyster Bay, a distance of 10 miles, was combined, by the river and harbor act of 1907, with the West Galveston Bay Channel, under one appropriation, as a part of the inland waterway on the coast of Texas.

The section is about 36 miles long, and practically parallel to the coast line of the Gulf of Mexico. The project was completed in 1909.

Among other improvements is the Houston Ship Channel, which includes the Morgan Canal and Cut purchased by the United States in 1892 at a cost of \$92,316. It connects Galveston Harbor with the city of Houston, a distance of 50 miles. The cost of the improvement was nearly \$5,000,000 and has made Houston practically a seaport.

WESTERN DIVISION.

California.—The state of California has no canalized rivers. There are several diverting canals. One of these recently completed is located near Stockton. It is about 5 miles long and diverts the waters of Mormon Channel into the Calaveras River. The state of California and city of Stockton furnished the right of way and the Federal Government built the canal, including a dam, at a cost of about \$250,000. A diversion dam and channel are under construction for the protection of Los Angeles and Long Beach harbors.

The principal river in the state is the Sacramento, navigable from Red Bluff to its mouth at Suisun Bay (Collinsville), a distance of 253 miles. Another important river is the San Joaquin. This river rises in the vicinity of Yosemite Valley, flows in a generally western direction for 325 miles, and empties into Suisun Bay. These rivers, together with Feather River and Stockton and Mormon Channels, have been greatly improved not only by the Federal Government but by the state of California and by the cities of Sacramento, Marysville, and Stockton.

Oregon and Washington.—The Columbia River rises in the southeastern part of British Columbia, and empties into the Pacific Ocean between the states of Washington and Oregon. It has a total length of 1,200 miles.

The section of the river from Celilo Falls to the mouth of Snake River is under improvement. Boulders, ledges, and reefs have been removed and gravel shoals and bars scraped for a distance of 124 miles. The channel is improved to the extent that navigation is possible at all stages of the river.

Between the foot of The Dalles Rapids and the head of Celilo Falls a canal has been built, $8\frac{1}{2}$ miles long, 65 feet wide at the bottom, and 8 feet deep. There are 5 locks, 300 by 45 feet, which cost nearly \$5,000,000. Prior to the canal being built this portion of the stream was not navigable at all. The canal was opened for traffic May 5, 1915.

Extensive improvement has also been made at the Cascades, 141 miles from the mouth of the river, where it passes through the Cascade Mountains. The channel at this point was unsafe and freight had to be transferred around the obstructions by teams and later by

a steam railroad until the completion of the canal in 1896. It is 3,000 feet long, 90 feet wide, 8 feet deep, and has two locks, 514 by 90 and 521 by 90 feet. The cost of the improvement was \$3,913,198.

The Willamette River, 294 miles long, rises in the Cascade Range in southwestern Oregon, flows north-erly, and empties into the Columbia River. On the west side of Willamette Falls near Oregon City, 25 miles above the mouth of the river, a canal with locks and dam was constructed in 1873 by private interests. The locks and canal consist of a flight of 4 locks, each 210 by 40 feet; a canal basin above the flight of locks 1,250 feet in length; a guard lock at the upper end of the basin 210 by 40 feet; and the upper entrance, 1,000 feet in length, making the total length, including the locks and entrance, about 3,500 feet. The plant was purchased by the United States April 26, 1915, for \$375,000.

The Yamhill River from the source of the south fork is 52 miles long. It rises in the Coast Range, flows easterly, and empties into the Willamette River about 42 miles above Portland. This river has a lock and dam located near La Fayette, 8 miles above its mouth. The Columbia and lower Willamette Rivers below Portland and Columbia River at its mouth are under-going extensive improvements.

In Washington the Cowlitz and Lewis Rivers, tributaries of the Columbia River, are being dredged, snagged, and otherwise improved. Grays River harbor and bar entrance and Willapa River and harbor have also been greatly improved.

A waterway or canal connecting Puget Sound with Lakes Union and Washington has been recently completed. It lies entirely within the city of Seattle and is approximately 8 miles long, 100 feet wide on the bottom, and 30 to 36 feet deep. Right of way and flowage rights were secured for the United States by King County. There are two locks and dams. One lock is 825 feet long and 80 feet wide, the largest in the west. It has two chambers, 450 feet and 375 feet long, respectively. The depth of water on the upper miter sill is 36 feet at low water in the upper pool, and on the intermediate and lower miter sills 25 feet at extreme low tide in Puget Sound, which will afford 36 feet at low water in the upper pool and mid-tide stages in Puget Sound. The other lock, 150 by 30 feet, is located south and alongside of the large lock. The project was 99 per cent completed in 1916, at a cost of \$2,663,211 to June 30, 1916. Of this amount the state has contributed nearly a quarter of a million and King County over half a million. The effect of the complete work will be to make accessible to deep-sea vessels both for coastwise and over-sea trade a large fresh-water basin of constant level with a shore line of about 100 miles.

Alaska.—St. Michael Canal is a salt-water channel, 18 miles long, running from St. Michael Harbor to a point on Norton Sound, 38 miles northwest of the

Apoon Mouth of the Yukon River, Alaska. It is 250 to 750 feet in width and for the greater part of its length the depth is 10 to 18 feet. Some parts, however, are only 2 to 4 feet deep. A channel was dug 100 feet wide and 6 feet deep from deep water in St. Michael Bay through the canal for a distance of $6\frac{1}{4}$ miles. It is the only sheltered channel for Yukon River boats which take and transship cargoes at St. Michael Harbor,

but the channel is very crooked and is not used now by vessels, due to difficulty of handling.

The Yukon River rises in British Columbia, flows in a generally western direction across Alaska, and empties into Norton Sound, an arm of Bering Sea. It is about 2,000 miles long and is navigable for light-draft river boats to the international boundary, about 1,500 miles.

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